



Harworth Group

Hay Green Lane, Birdwell

Phase 2 Geo-environmental Site Investigation

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1 INTRODUCTION

1.1 Commissioning

RSK Environment Limited (RSK) was commissioned by Harworth Group to carry out a Geoenvironmental Site Investigation of the land at Hay Green Lane, Birdwell, Barnsley, S70 5XD. The project was carried out to an agreed brief as set out in RSK's proposal (Ref. 350283/TL02/1a, dated November 2019).

This report is subject to the RSK service constraints given in Appendix A and limitations that may be described through this document.

1.2 Proposed development

The site in question is being considered for development for residential use. The planned layout of the site is not known at this stage.

1.3 Objectives

The objective of the work is:

- to identify any land contamination and/or geotechnical constraints to the proposed development
- to identify the need for any additional investigation or remediation works to demonstrate that the site is suitable for its proposed use

1.4 Scope of works

The scope of this assessment has been developed in accordance with relevant British Standards and authoritative technical guidance as referenced through the report. The assessment of the contamination status of the site is in line with the technical approach presented in CLR 11 Model Procedures for the Management of Land Contamination (Environment Agency, 2004) and in general accordance with BS 10175: 2011 + A2 2017 (BSI, 2017). It is also compliant with relevant planning policy and guidance.

The scope of the intrusive investigation has been designed in line with the recommendations of BS5930: 2015 Code of practice for ground investigations (BSI, 2016), which maintains compliance with BS EN 1997-1 and 1997-2 and their related standards. It has also been developed in general accordance with BS 10175: 2011 + A2 2017. Ground gas assessment has been undertaken in general accordance with BS8756: 2013 and BS 8485:2015+A1:2019.

A brief summary of relevant legislation and policy relating to contaminated land is given in Appendix B.



The scope of works for the assessment has included the following:

Desk Study:

- review of the history of development on the site and surroundings, including a study of historical Ordnance Survey mapping and other sources of historical information via an environmental database report
- assessment of local geology, hydrogeology and surface water setting, including the identification of potential geological hazards including mining etc.
- assessment of the potential risks from past, present and future coal mining activities obtained from a Coal Authority Mining Report
- completion of a site reconnaissance survey to assess the visual condition of the site
- development of an initial conceptual site model (CSM) identifying potential contaminant linkages for potential contaminants, completion of a preliminary risk assessment (PRA) and identification of key uncertainties and assumptions in the CSM
- preliminary consideration of geotechnical constraints and hazards
- identification of the need for further action, e.g. intrusive investigations, if any.

Intrusive Investigation

- design and implementation of an intrusive investigation, in situ testing, soil sampling, laboratory geo-environmental and geotechnical testing, groundwater and ground gas monitoring of installed boreholes
- interpretation of data to develop a refined conceptual site model (CSM)
- generic quantitative risk assessment (GQRA) to evaluate potentially complete contaminant linkages identified in the refined CSM
- identification of the need for further action, e.g. supplementary intrusive investigations/monitoring, remediation works or other mitigation, if any.
- interpretation of ground conditions and geotechnical data to provide preliminary recommendations with respect to foundations and infrastructure design;
- preparation of this factual and interpretative report with recommendations for further works (i.e. undertake a remedial options appraisal to identify appropriate mitigation measures/produce a remedial implementation and verification plan) and/or remediation as necessary.

1.5 Existing reports

The following reports detailing previous works at the site were made available for review:

- RSK, Preliminary Risk Assessment and coal mining risk assessment: Hay Green Lane, Birdwell, 350283-R1(00), November 2019.

Pertinent information from these reports has been summarised in Section 2.



1.6 Limitations

The comments given in this report and the opinions expressed are based on the ground conditions encountered during the site work and on the results of tests made in the field and in the laboratory. However, there may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account. In particular, it should be noted that there may be areas of made ground not detected due to the limited nature of the investigation or the thickness and quality of made ground across the site may be variable. In addition, groundwater levels and ground gas concentrations and flows may vary from those reported due to seasonal, or other, effects and the limitations stated in the data should be recognised.

Asbestos is often present in soils in discrete areas. Whilst asbestos-containing materials may not have been locally encountered during the fieldworks or supporting laboratory analysis; asbestos may still be present in soils and could be encountered during more extensive ground works.

2 SITE DETAILS

2.1 Site location

Site location details are presented in Table 1 and a site location plan is provided on Figure 1.

Table 1 Site location details

Site name	Hay Green Lane, Birdwell
Full site address and postcode	Hay Green Lane, Birdwell, Barnsley, S70 5XD
National Grid reference (centre of site)	434780, 401350

2.2 Site description

The site boundary and current site layout are shown on Figure 2. The site covers an area of c. 4 hectares. It is currently occupied by allotment gardens and pastoral land (currently used by horses) in the western part of site, with associated sheds and stables. A public footpath lies along the eastern site boundary and an overhead line runs across the south eastern corner of site, orientated northeast to southwest. The site generally slopes gently to the north east.

2.3 Surrounding land uses

The site is located in Birdwell, within a predominantly residential setting. Immediate surrounding land uses are described in Table 2.

Table 2 Surrounding land uses

North	Residential properties (adjacent) and Hay Green Lane
East	Residential property (Hawkwood Cottage, adjacent) and agricultural land
South	Agricultural land
West	Residential properties, then Sheffield Road (A61) and recreation ground

2.4 Development plans

The proposed layout of the site, at the time of preparing this report, has not been provided. No details of the proposed ground levels have been provided therefore for the purpose of this report it has been assumed that the current levels will remain unchanged.

3 DESK-BASED ASSESSMENT

3.1 Site history

3.1.1 Historical development record

The development history of the site and surrounding area based upon assessment of historical plans and records is detailed in Table 3. The historical maps reviewed are shown within the environmental database report in Appendix C.

Table 3 Summary of historical development

Date	Land use/features on site	Land use/features in vicinity of site (of relevance to the assessment)
1855	<ul style="list-style-type: none"> The site comprises agricultural fields A well is indicated close to the southern site boundary 	<ul style="list-style-type: none"> The surrounding land-use is predominantly agricultural Residential and/or farm properties (including Hay Green House) lie adjacent to the north of site A well is indicated near to the western site boundary (around 10m – 20m west)
1893	<ul style="list-style-type: none"> The well on site is no longer shown 	<ul style="list-style-type: none"> The well is no longer shown Rockingham Colliery lies from approximately 560m south east, including railway sidings Reservoir indicated 560m south east of site Brick works including clay pits indicated 650m north east of site
1905-1906	<ul style="list-style-type: none"> No significant change 	<ul style="list-style-type: none"> Recreation ground indicated adjacent to the south of site Spoil heap associated with Rockingham Colliery indicated approximately 380m south east
1931	<ul style="list-style-type: none"> Allotment gardens are indicated in the western part of site 	<ul style="list-style-type: none"> Residential properties have been built along Hay Green Lane adjacent to the northern site boundary Spoil heap associated with Rockingham Colliery situated 530m south east of site
1932	<ul style="list-style-type: none"> No significant change 	<ul style="list-style-type: none"> Allotment garden area has extended to include an area adjacent to the south of site
1948	<ul style="list-style-type: none"> No significant change 	<ul style="list-style-type: none"> Large mounds indicated 500m south east of site

1962	<ul style="list-style-type: none"> • Several small structures, presumably sheds and/or stables, in the western part of site 	<ul style="list-style-type: none"> • No significant change
1965-1966	<ul style="list-style-type: none"> • No significant change 	<ul style="list-style-type: none"> • Large mounds now shown as slag heap/ refuse tip (500m south east) • Allotment garden area adjacent to the south no longer indicated
1989	<ul style="list-style-type: none"> • No significant change 	<ul style="list-style-type: none"> • Railway sidings associated with Rockingham Colliery have been dismantled, which is now annotated as disused workings • Spoil mounds associated with Rockingham Colliery and the reservoir are now shown as slag heaps/ refuse tips
2000	<ul style="list-style-type: none"> • Locations of sheds/ stables have altered 	<ul style="list-style-type: none"> • Slag heaps/ refuse tips no longer shown • Brick works no longer shown
2019	<ul style="list-style-type: none"> • No significant change 	<ul style="list-style-type: none"> • No significant change

The review of the site history has indicated that allotment gardens were present in the western part of site from the 1930's to present and the eastern part of site has remained as agricultural land from the 1800's to present.

Current aerial photography shows possible buildings and/or structures in a part of the western site area which may have been former farm buildings or allotment structures. This area could not be accessed during the site walkover due to dense vegetation.

A well was indicated on site in 1855, but was no longer shown by 1893.

In the surrounding area, Rockingham Colliery was situated 560m south east, with associated spoil heaps from 380m south east. A brick works with associated clay pits was situated from 650m north east of site from 1893 and was no longer indicated by 2000. None of the historical land uses in the surrounding area are considered potential contaminant sources owing to their distance from site (greater than 250m).

It should be noted that the Rockingham opencast adjacent to site and the unlicensed opencast 20m south of site have not been captured on historical mapping.

3.1.2 Unexploded ordnance

A review of publicly available unexploded ordnance (UXO) risk maps indicates that the site is located in an area with low potential for wartime bombs to be present (Zetica, 2020).

3.1.3 Site services

Buried utility services and their backfill can provide preferential pathways for gas, vapour or groundwater to migrate along to another part of the site or to a receptor. They can also represent significant constraints to development.

Service plans obtained from utility companies by RSK are contained in Appendix E.

3.2 Site geology

3.2.1 Anticipated geological sequence

Published records (British Geological Survey, 2008) for the area and available historical borehole logs indicate the geology of the site to be characterised by the succession recorded in Table 4. There is one publicly available BGS historical borehole located on or within 500m of the site, which is presented in Appendix D.

Table 4 Site geology

Strata	Description	Estimated thickness	Permeability
Pennine Middle Coal Measures Formation	Interbedded grey mudstone, siltstone, pale grey sandstone and commonly coal seams.	200 – 650	Low
Relevant information sources: BGS Geoindex <input checked="" type="checkbox"/> BGS borehole logs <input checked="" type="checkbox"/> Previous SI reports <input type="checkbox"/>			

Published geological records indicate that there are no superficial deposits beneath the site. The bedrock is recorded as being Pennine Middle Coal Measures and dips to the north east.

A BGS borehole record (borehole reference SE30SE13, presented as Appendix D), located 400m south east of site has been reviewed. This location has since been subject to opencast mining; however the record gives an indication of the anticipated geology beneath the site. The borehole encountered a thin layer of soil and clay initially, with the Swallow Wood Coal seam recorded at 20.93m depth, which was 0.93m in thickness. The borehole recorded the Lidgett Coal seam at 88.47m depth, which was 1.24m in thickness. Beneath these several further bands of coal are reported to the base of the borehole at 313m bgl.

The 1:50,000 geological map for the area (Geological Survey of Great Britain, sheet 87, 2008) shows the Swallow Wood coal seam to sub-crop in the south western part of site. The next recorded coal seam beneath the Swallow Wood is the Lidgett, 55m deeper.

A fault known as the Birdwell Fault crosses the north western part of site, orientated north east to south west and is downthrown on the north western side.

3.2.2 Radon

The environmental database report provides an assessment of site-specific radon risk. The report indicates that 1% to 3% of homes are above the Action Level of 200 Bq m⁻³ and that no radon protective measures are required within new dwellings at the site.

The site-specific assessment within the environmental database report is at a higher resolution and therefore provides greater detail than that publicly available in the indicative radon atlas at www.ukradon.org.

3.3 Mining and quarrying

Evidence has been sought to identify any mining, quarrying, landfilling and land reclamation operations, past and present, which have taken place within 500m of the site.

3.3.1 Coal mining area

The site is located over Coal Measures bedrock and may therefore have been affected by coal mining activities. In these areas the assessment of mining legacy issues should be carried out in accordance with the guidance provided by the Coal Authority, who adopt a risk-based approach for the advice that they offer on proposed development sites. The Coal Authority are a statutory consultee to Local Planning Authorities in respect of building development within the defined coal mining areas of England, Wales and Scotland where a planning application is required.

An initial site appraisal has been carried out based on the information provided on the Coal Authority Interactive Viewer of the UK Coalfield areas.

This indicates the site lies within the Coal Authority Consultation Area and includes Development High Risk Areas. It is a requirement for development within a High Risk Areas to prepare a desk-based Coal Mining Risk Assessment (CMRA) report to support planning applications for new building developments.

A CMRA needs to consider a number of sources of information to determine coal mining issues relevant to a site, it then needs to identify and assess the site-specific coal mining risks and propose an appropriate mitigation strategy relevant for the proposed site end-use. This approach has been followed in the current assessment and is presented in Section 4.

The key findings from review of the datasets from the Coal Authority Interactive Viewer and the Coal Mining report are summarised in Table 5.

Table 5 Summary of key coal mining information

Item	Applicable to site?	Comment
Development High Risk Area on-site	Yes	N/A
Coal mine entries	No	The nearest recorded mine entry is 60m north west.
Past shallow workings (recorded)	Yes	The site has been subject to underground mining in eight seams of coal at 55m to 327m depth, the last date of underground working being at Rockingham Colliery in 1979.
Probable shallow workings	Yes	The Coal Authority report indicates that unrecorded shallow workings may be present on site.
Coal seam outcrops	Yes	The Swallow Wood coal seam sub-crops in the southwestern part of site.

Item	Applicable to site?	Comment
Surface mining (opencast)	No	The Coal Authority report states that the site does not lie within the working boundary of a former opencast mine, although licensed opencast workings were carried out on the land lying adjacent to the south of site at the Rockingham opencast site.
Other	BGS recorded mineral site	There is a record of a BGS recorded mineral site indicated in the environmental database report at a site known as Hay Green Coal Workings, where coal was extracted from the Swallow Wood coal seam. The database report positions this in the southwestern part of site; however this may be a record for the unlicensed opencast workings 20m to the south of site.

3.4 Hydrogeology

A summary of the hydrogeological setting of the site, with respect to the anticipated geological sequence set out in Section 3.2 is presented below in Table 6.

Table 6 Summary of hydrogeological setting

Condition	Description
Aquifer characteristics	The site is underlain by a secondary A aquifer relating to the Bedrock. The presence of low permeability clay at relatively shallow depths beneath the site, while restricting downwards migration, may increase the potential for lateral migration of shallow groundwater (and therefore mobile contamination, if present).
Depth to groundwater and flow	The depth to the groundwater table unknown. The regional direction of groundwater flow is likely to be to the northeast, following the dip of the coal measures bedrock and the local topography.
Rising groundwater levels	Not applicable
Groundwater recharge/attenuation	Most of the site is currently unsurfaced and will therefore drain to ground.
Licensed groundwater abstractions	The environmental database report indicates that there are no groundwater abstractions within a 1km radius of the site.
Source protection zones	Information available in the Envirocheck report/ MAGIC website indicates that the site does not lie within a currently designated groundwater Source Protection Zone (SPZ).

3.5 Hydrology

A summary of the hydrology within the site area is summarised in Table 7.

Table 7 Summary of hydrology in site area

Condition	Description
Surface watercourse/features	The nearest surface watercourse to site is Shortwood Dike situated approximately 340m northeast of site. There is also a pond situated approximately 180m north east of the site.
Surface water abstractions	There are no surface water abstractions identified by the environmental database, within a 1km radius of the site.
Site drainage	Natural rainwater percolation through site soils as much of the site is undeveloped.
Preliminary flood risk assessment	The indicative floodplain map for the area, published by the EA, shows that the site does not lie within or on the margin of a designated floodplain.

3.6 Sensitive land uses

Table 8 provides a summary of any environmentally sensitive areas identified within 500 m of the site based on the environmental database report.

Table 8 Environmentally sensitive areas

Feature	Present within 500m of site?	Details	Likely pathways from site?
International designations – Ramsar wetland, Special Area of Conservation (SAC), Special Protection Area (SPA)	No	N/A	N/A
National designations – Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), ancient woodland	No	N/A	N/A
Local designations – Local Nature Reserve, Site of Importance for Nature Conservation (SINC)	No	N/A	N/A



Feature	Present within 500m of site?	Details	Likely pathways from site?
Nearest high sensitivity development, e.g. residential	N/A	North and West of site	No

4 COAL MINING RISK ASSESSMENT

The Coal Authority (CA), in common with other statutory consultees, utilises a risk-based approach for the advice that they offer on proposed developments in relation to coal mining legacy issues. The site lies within the Coal Authority Consultation Area and includes Development High Risk areas. It is a requirement for High Risk areas to prepare a desk-based Coal Mining Risk Assessment (CMRA) Report to support planning applications.

A CMRA needs to consider a number of sources of information to determine coal mining issues relevant to a site. It then needs to identify and assess the site-specific coal mining risks and propose an appropriate mitigation strategy relevant for the proposed site end-use. This approach has been followed in the current assessment. The site-specific coal mining risks for the area are summarised in Section 4.1 and this is followed by the mitigation strategy in Section 4.2.

It is considered that the CMRA presented here is adequate to support a detailed planning application in relation to coal mining risk assessment and mitigation.

4.1 Summary of site-specific coal mining risks

4.1.1 Underground workings

The Coal Authority report indicates that the site has been subject to underground mining in eight seams of coal at 55m to 327m bgl. The shallowest workable seam with recorded workings present below the site is the Lidgett Coal Seam, which based on the records held by the CA, is at approximately 55m bgl, with an extraction thickness of 66cm.

The Swallow Wood coal seam is indicated to sub-crop in the southwestern part of site. This shallow seam, as well as the underlying Unnamed 3 coal seam were worked by opencast mining methods at Rockingham opencast to the south of site (see Section 4.1.3). These seams are likely to be present on site at a shallower depth to the adjacent land and it is possible that unrecorded shallow workings may be present on site associated with these shallow coal seams.

Evidence of older shallow workings is indicated on the Rockingham opencast completion plan for the Swallow Wood coal seam (Drawing number 82/CP-2). The plan shows a significant number of former bell-pit workings recorded at the time of RJB opencast works, approximately 150m south of site, which are indicated to have previously extracted coal from the Swallow Wood seam.

4.1.2 Old mine entries

A review of the CA mining report indicates that there are no known coal mine entries on, or within 20m of, the site boundary. The nearest recorded mine entry is 60m north west.

4.1.3 Opencast areas

The site does not lie within the working boundary of a former opencast mine, although licensed opencast workings were carried out on the land lying adjacent to the south of site



at the Rockingham opencast site. There is also an area of unlicensed opencast workings approximately 20m to the south of site.

The following completion plans (from UK Coal) have been reviewed for the Rockingham opencast site, which was operated by RJB Mining from 1989 to 1995:

- Rockingham Completion Plan, RJB Mining (UK) Limited, dated 13 February 1998. Sheets 1 to 7. Drawing numbers 82/CP-1 to CP-7.

The plans detail the coal horizons encountered and excavated during the opencast operations.

Figure 3 in the previous RSK report 322494-R01 (00) shows the extent of the workings in two seams adjacent to the south of site, starting with the shallowest:

- Swallow Wood (RJB Code AR)
- Unnamed 3 (RJB Code 1AQ)

The shallowest worked seam adjacent to the south of site was the Swallow Wood (AR), with the base of excavation for this being just below 126m AOD. It is evident that this seam dipped downwards towards the north-east.

The area of unlicensed opencast workings is located from 20m to the south of site and extends some 300m to the south east.

4.1.4 Coal Measures as a gas source

The underlying Coal Measures strata and underground workings are a potential source of coal bed methane and carbon dioxide.

4.2 Mitigation strategy

The CMRA completed in the preceding sections has concluded that there are some issues relating to coal mining which might influence the proposed residential development.

Aspects of coal mining and extraction discussed in the CMRA are covered in turn in this section, with comments provided as to why mitigation measures are considered necessary or not.

4.2.1 Underground workings

Where coal is extracted by underground mining techniques a void is left behind where the coal seam has been removed. Over time this can collapse with the result that the void progressively migrates upwards. Where the mining is at significant depth this will be accommodated by bulking up of the overlying materials until no further progression is possible, however if the workings are at shallow enough depth this may result in formation of crown holes and instability at the overlying ground surface. It is generally accepted that collapse within a coal seam causes only negligible risk to the stability of the ground surface above provided the thickness of intact rock above the seam is at least ten times the thickness of the worked seam, although this will be dependent on the materials present and site-specific conditions.



It has been concluded that there is sufficient rock cover above the Lidgett coal seam, in which there are recorded workings. However, there may be shallow unrecorded workings at the site and there is the possibility that collapse of the workings could cause instability at the surface. It will be necessary to undertake intrusive investigation to assess this risk.

4.2.2 Old mine entries

There are no old mine entries recorded within or immediately around the site boundary. No mitigation measures are therefore required. However, the presence of shallow bell pitting in the Swallow Wood coal cannot be ruled out, therefore it would be prudent to have a watching brief during initial topsoil strip to identify if bell pits are present.

4.2.3 Opencast areas

The site lies outside the area subject to licensed and unlicensed opencast coaling operations, therefore no mitigation measures are required.

4.2.4 Coal Measures as a gas source

The underlying Coal Measures strata and underground workings are a potential source of methane and carbon dioxide. A ground gas risk assessment will be required at the site to determine the ground gas regime and consequently the requirements or otherwise for gas ingress preventative measures.

5 SITE RECONNAISSANCE FINDINGS

A site reconnaissance survey was completed on 8 November 2019 by RSK. The characteristics of the site observed during the walkover and from current ordnance Survey maps are summarised below.

Two garages in the south western corner of site have possible asbestos cement sheet roofing. No other potentially significant sources of contamination were identified on site, except for the general land use as allotments and agricultural land.

Japanese knotweed is a non-native, highly invasive species and spreads via rhizomes (underground 'stems') rather than seeds in the UK. It is found in a range of habitats across the UK including roadsides, riverbanks and derelict land. Japanese knotweed **was not** identified during the site visit. However, Japanese knotweed is difficult to identify outside the growing season (March to September/October). As the site visit was conducted in November it is unlikely that any Japanese knotweed present could be identified accurately and, as such, we recommend that the site be resurveyed during the growing season.

No evidence for an historic well (identified on historical mapping from 1855 – see section 3.1) was noted during the site walkover.

The ground was noted to be waterlogged over much of the site, with some areas of standing water and some flooding within the allotments. The survey was conducted following heavy rainfall.

Some areas in the western half of the site could not be accessed during the survey, as shown on Figure 2. This includes allotment plots and a densely vegetated area to the south of the allotments.

A site layout plan is provided in Figure 2 with photographic records included in Appendix F detailing the main features identified.

Whilst the walkover summary includes consideration of current operations and housekeeping on the site as potential sources of contamination, it does not constitute a comprehensive environmental audit of the site, as covered under ISO 14001.

No potentially significant land contamination or geotechnical issues were identified during the site reconnaissance survey.

6 PRELIMINARY GEOTECHNICAL CONSTRAINTS

6.1 Design class

BS EN 1997-1 defines three different Geotechnical Categories that structures may fall into, which are summarised as follows:

- Category 1: Small and relatively simple structures for which it is possible to ensure that the fundamental requirements will be satisfied on the basis of experience and qualitative geotechnical investigations; with negligible risk
- Category 2: Conventional types of structure and foundation with no exceptional risk or difficult ground or loading conditions
- Category 3: Structures or part of structures, which fall outside limits of Geotechnical Categories 1 and 2. Examples include very large or unusual structures; structures involving abnormal risks, or unusual or exceptionally difficult ground or loading conditions; structures in highly seismic areas; structures in areas of probable site instability or persistent ground movements that require separate investigation or special measures.

Based on the information provided above on the proposed development and in view of the anticipated ground conditions, a Geotechnical Category of Category 2 has been assumed for the purposes of designing the geotechnical investigation. This should be reviewed at all stages of the investigation and revised where necessary.

6.2 Preliminary geotechnical hazards assessment

A summary of commonly occurring geotechnical hazards associated with the anticipated geology outlined in Section 3 above is given in Table 9 together with an assessment of whether the site may be affected by each of the stated hazards.

Table 9 Summary of preliminary geotechnical risks that may affect site

Hazard category	Hazard status based on desk study findings and proposed development		Engineering considerations if hazard affects site
	Could be present and/or affect site	Unlikely to be present and/or affect site	
Sudden lateral changes in ground conditions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Likely to affect ground engineering and foundation design and construction
Shrinkable clay soils	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Design to NHBC Standards Chapter 4 or similar

Hazard category	Hazard status based on desk study findings and proposed development		Engineering considerations if hazard affects site
	Could be present and/or affect site	Unlikely to be present and/or affect site	
Highly compressible and low bearing capacity soils, (including peat and soft clay)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Likely to affect ground engineering and foundation design and construction
Silt-rich soils susceptible to rapid loss of strength in wet conditions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Likely to affect ground engineering and foundation design and construction
Running sand at and below water table	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Likely to affect ground engineering and foundation design and construction
Karstic dissolution features (including 'swallow holes' in Chalk terrain)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	May affect ground engineering and foundation design and construction – refer to Section 4.1.2
Evaporite dissolution features and/or subsidence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	May affect ground engineering and foundation design and construction
Ground subject to or at risk from landslides	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Likely to require special stabilisation measures
Ground subject to periglacial valley cambering with gulls possibly present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Likely to affect ground engineering and foundation design and construction
Ground subject to or at risk from coastal or river erosion	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Likely to require special protection/stabilisation measures
High groundwater table (including waterlogged ground)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	May affect temporary and permanent works
Rising groundwater table due to diminishing abstraction in urban area	<input type="checkbox"/>	<input checked="" type="checkbox"/>	May affect deep foundations, basements and tunnels
Underground mining	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Likely to require special stabilisation measures
Effects of extreme temperature (e.g. cold stores or brick kilns/furnaces)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Likely to affect ground engineering and foundation design and construction
Existing sub-structures (e.g. tunnels, foundations, basements, and adjacent sub-structures)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Likely to affect ground engineering and foundation design and construction

Hazard category	Hazard status based on desk study findings and proposed development		Engineering considerations if hazard affects site
	Could be present and/or affect site	Unlikely to be present and/or affect site	
Filled and made ground (including embankments, infilled ponds and quarries)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Likely to affect ground engineering and foundation design and construction
Adverse ground chemistry (including expansive slags and weathering of sulphides to sulphates)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	May affect ground engineering and foundation design and construction
Site topography	<input checked="" type="checkbox"/>	<input type="checkbox"/>	May affect ground engineering and foundation design and construction
Note: Seismicity is not included in the above table as this is not normally a design consideration in the UK.			

7 INITIAL CONCEPTUAL SITE MODEL

In line with CLR11 (Environment Agency, 2004) and BS 10175: 2011 + A2 2017 (BSI, 2017), RSK has used information in the preceding sections to identify sources of contaminants, receptors that may be impacted and plausible linking pathways. Where all three are present this is termed a potentially complete contaminant linkage and a qualitative risk estimation is made.

7.1 Potential soil, soil vapour and groundwater linkages

7.1.1 Potential sources of contamination

Potential sources of soil and groundwater contamination identified from current activities and the history of the site and surrounding area are presented in Table 10. Ground gas sources are addressed in the next section.

Table 10 Potential sources of soil and groundwater contamination

Potential sources	Contaminants of concern	Current or historical?
On-site		
Allotments	PAH, hydrocarbons, metals, inorganic chemicals, pH, asbestos. Domestic ash may have been deposited on the allotments to make up paths and condition the soil	Current/historical
Agricultural land	Hydrocarbons, PAH, metals, inorganic chemicals, pH	Current/historical
Off-site		
Rockingham opencast	PAH, hydrocarbons, metals, pH, asbestos	Historical
Unlicensed opencast (20m south)	PAH, hydrocarbons, metals, pH, asbestos	Historical

7.1.2 Sensitive receptors and linking exposure/migration pathways

Sensitive receptors identified at or in the vicinity of the site that could be affected by the potential sources identified above comprise:

- future site users – residential users [oral, dermal and inhalation exposure with impacted soil, soil vapour and dust/fibres, ingestion of home-grown produce]
- current adjacent site users – residential users [migration of contamination via dust/fibre deposition, vapour or groundwater migration combined with inhalation]
- future buildings and services [direct contact with contaminated soils or groundwater and chemical attack]

- existing/ future vegetation [direct contact with contaminated soils or groundwater and root uptake leading to phytotoxicity]
- groundwater in secondary A aquifer within bedrock deposits [percolation through permeable strata to aquifer]
- surface water course (Shortwood Dike) [lateral migration / site run-off / drainage]

Potential linking pathways are show in brackets for each item above.

Please note that construction workers and future maintenance workers have not been identified in the conceptual model as receptors because risks are considered to be managed through health and safety procedures according to the CDM Regulations.

7.2 Potential ground gas linkages

7.2.1 Ground gas generation potential

Potential ground gas sources identified for the site and surrounding are shown in Table 11.

Table 11 Potential ground gas sources

Potential sources	Indicative ground gas generation potential (CIEH, 2008)	Additional information
On-site		
Underlying Coal Measures strata and underground mine workings Opencast backfill (Rockingham opencast and unlicensed opencast) – likely to be predominantly inert	High	Carbon dioxide, methane and trace gases

Given the anticipated ground conditions set out above, significant potential sources of ground gas generation have been identified.

7.2.2 Preferential pathways for ground gas migration

Credible preferential pathways potentially connecting the source and receptor through vertical and lateral migration are:

- geology of the Coal Measures formation which is likely to be permeable.
- building foundations
- construction joints and cracks within building structure
- utility routes and service penetrations into buildings

7.2.3 Sensitive receptors and linking pathways

Sensitive receptors identified at or in the vicinity of the site that could be affected by the potential ground gas sources identified above comprise:

- Future site users – residential users [migration and ingress of ground gases into buildings, build-up in confined spaces and explosion/ asphyxiation]
- Future buildings and services [migration and ingress of ground gases into buildings, build-up in confined spaces and explosion].

The assessment has identified receptors to include building structures and proposed end-users.

Construction workers have not been identified as receptors for the purposes of this assessment. Risks may still be present to construction workers especially where works include the entry into excavations within the ground. Construction workers should undertake appropriate risk assessments and risks should be managed through health and safety procedures and the use of PPE.

7.3 Preliminary risk assessment

The preliminary risk assessment findings and potentially complete contaminant linkages are shown in Table 13 overleaf. The risk classification based on the combination of hazard consequence and probability using a risk matrix from CIRIA C552 (Rudland et al., 2001), a summary of which is included in Appendix G. The initial conceptual site model is shown schematically in Figure 3.

Table 12 Risk estimation for potentially complete contaminant linkages

Potential source	Potential receptor	Possible pathway	Likelihood	Severity	Risk
Contaminants in site soils potentially containing hydrocarbons, PAH, inorganic chemicals, pH, asbestos	Future on-site occupants	Direct contact (soil, dust and vegetable ingestion, dermal contact, dust and fibre inhalation)	Low	Medium	Moderate/low. Potential for site users to come into contact with soils if there is an absence of hardstanding or clean cover systems in place. However, previous and current land use indicates significant contamination is not anticipated.
	Vegetation	Root uptake	Unlikely	Medium	Low. Impacted shallow soil could inhibit plant growth. However, previous and current land use indicates significant contamination is not anticipated.
	Underground potable water supply pipes	Direct contact: permeation	Likely	Medium	Moderate. Potential for permeation of water supply pipes from contaminants could create health risk. Owing to site location and use as allotments, coal/ash is likely to be present within shallow soils, indicating potential organic contamination including PAH.
	Shallow groundwater	Leaching	Low	Mild	Low. Shallow groundwater is not deemed sensitive and previous and current land use indicates significant contamination is not anticipated.



Potential source	Potential receptor	Possible pathway	Likelihood	Severity	Risk
Affected shallow groundwater as a result of historical or current leaching of soil contaminants	Underground potable water supply pipes	Permeation	Low	Medium	Moderate/low. The potential for the permeation of water supply pipes by contaminants in shallow groundwater could create a health risk. Significant volumes of hydrocarbons are unlikely to have been used on-site, however PAH associated with coal/ash in the soil may be present within shallow groundwater.
	Groundwater in Secondary A aquifer	Vertical migration	Low	Mild	Low. Some vertical migration may occur through permeable granular horizons within weathered Coal Measures strata (clay); however, this is likely to be minimal and previous and current land use indicates significant contamination is not anticipated.
	Surface water receptors (pond and Shortwood Dike)	Lateral and vertical migration	Low	Mild	Low. Some lateral and vertical migration may occur through permeable granular horizons within weathered Coal Measures strata (clay); however, this is likely to be minimal and the distance to the potential receptors is likely to facilitate considerable attenuation.

Potential source	Potential receptor	Possible pathway	Likelihood	Severity	Risk
Ground gases including carbon dioxide and methane derived from underlying coal measures strata, underground workings and off-site opencast backfill	Future on-site occupants and properties	Migration of soil gas via permeable shallow geology and build up in enclosed building spaces	Low	Severe	Moderate. If a pathway exists there is a potential for a risk of asphyxiation (from carbon dioxide) if gas concentrations build up in confined spaces or explosion if there is a build-up of methane. The off-site opencast backfill is likely to comprise predominantly inert materials.

Risk matrix	Consequences			
	Severe	Medium	Mild	Minor
Highly likely	Very high	High	Moderate	Moderate/low
Likely	High	Moderate	Moderate/low	Low
Low likelihood	Moderate	Moderate/low	Low	Very low
Unlikely	Moderate/low	Low	Very low	Very low



Potentially complete contaminant linkages with a potential risk of moderate to low or higher identified in in Table 13 comprise:

- Direct contact of the potential contamination within the soils to future on-site occupants.
- Permeation of plastic water supply pipes by contaminants in soil and shallow groundwater.
- Migration and build-up of ground gas within on-site buildings.

These potentially complete contaminant linkages need to be assessed further through appropriate site investigation to target the identified sources of potential contamination and assess the feasibility of identified pathways.

7.4 Data gaps and uncertainties

An area in the western part of site could not be accessed during the site walkover, due to dense vegetation. Aerial photography shows possible buildings and/ or structures; however, it is not known whether or not these have been removed. This represents a potential source of uncertainty and risk in relation to the presence of potential contamination sources (including the potential for ACM) and underlying soils.

8 SITE INVESTIGATION STRATEGY & METHODOLOGY

8.1 Introduction

RSK carried out intrusive investigation works and subsequent monitoring of boreholes between January 2020 and September 2020.

8.2 Objectives

The specific objectives of the investigation were as follows:

- to establish the ground conditions underlying the site including the extent and thickness of any made ground
- to investigate specific potential sources of contamination identified in initial CSM
- to determine the ground gas regime underlying the site
- to assess geotechnical properties of soils

8.3 Selection of investigation methods

The techniques adopted for the investigation were chosen with consideration of the objectives and site constraints, which are described below.

Rotary openhole drilling was selected to provide coverage across the site and to determine the presence of shallow underground mine workings, along with enabling the installation of combined groundwater/ground gas monitoring wells. Windowless sampling was chosen based on the targeted drill depth, the opportunity to collect disturbed samples and installation of ground gas monitoring wells. This was supplemented by mechanically excavated trial pitting to obtain a number of investigation locations and achieve greater visibility of the underlying ground conditions, as well as enabling soakaway testing to be conducted in selected location. Hand pitting was also undertaken to enable samples to be obtained from within allotment areas which were inaccessible to machinery.

Prior to conducting intrusive works, utility service plans were obtained and buried service clearance undertaken in line with RSK's health and safety procedures. Copies of statutory service records obtained by RSK as part of the agreed scope of works are contained in Appendix E.

8.4 Investigation strategy

The ground investigation was carried out using intrusive ground investigation techniques in general accordance with the recommendations of BS5930: 2015 Code of practice for ground investigations, which maintains compliance with BS EN 1997-1 and 1997-2 and their related standards. Whilst every attempt was made to record full details of the strata encountered in the boreholes, techniques of hole formation and sampling will inevitably lead to disturbance, mixing or loss of material in some soils and rocks.

The investigation strategy involved targeted and non-targeted boreholes and trial pits.

The constraints to the investigation were as follows:

- overhead and underground services,
- access restrictions e.g. allotments/horses and overgrown areas.
- nesting birds with allotments

Some vegetation clearance works were undertaken in order to create access to previously unreachable areas of the site.

Details of the ground investigation locations, installations and rationale are presented in Table 13. Ten machine excavated trial pits were dug to a maximum depth of 2.7m bgl before being backfilled with arisings. Twelve windowless sample boreholes were drilled to a maximum depth of 4m bgl, six of which were installed with a combined gas and groundwater monitoring well. Ten rotary openhole boreholes were drilled to a maximum depth of 30m bgl, five of which were installed with a combined gas and groundwater monitoring well. Nine hand dug pits were dug to a maximum depth of 0.5m bgl before being backfilled with arisings.

Table 13 Exploratory hole and monitoring well location rationale

Investigation type	Number	Designation	Monitoring well installation	Rationale examples below
Boreholes by rotary openhole methods	10	BH101, BH103, BH104, BH108, BH109	None	To prove the geological succession beneath the site and assess the presence of coal seams beneath the site.
		BH102, BH105, BH106, BH107, BH110	Gas/ groundwater	To prove the geological succession beneath the site, assess the presence of coal seams beneath the site and to install additional deeper, dual purpose groundwater and gas monitoring wells
Boreholes by dynamic/ windowless sampling methods	12	WS102, WS104, WS104, WS106, WS108, WS109	None	To determine the contamination status of the ground beneath the site and carry out in-situ geotechnical testing.
		WS101, WS103, WS105, WS107, WS110, WS111	Gas/ groundwater	To determine the contamination status of the ground beneath the site, carry out in-situ geotechnical testing and to install additional dual purpose groundwater and gas monitoring wells
Trial-pits excavated by	10	TP01 to TP08,	N/A	To accurately log the upper strata in non-targeted locations

Investigation type	Number	Designation	Monitoring well installation	Rationale examples below
mechanical excavator		TP201 & TP202		beneath the site and collect samples from the shallow soils.
Trial-pits excavated by hand	9	HP1 – HP9	N/A	Collect samples from the shallow soils within allotment areas.

8.4.1 Implementation of investigation works

The exploratory holes were logged by an engineer in general accordance with the recommendations of BS 5930:2015 (which incorporates the requirements of BS EN ISO 14688-1, 14688-2 and 14689-1).

The monitoring well construction and associated response zones are detailed on the exploratory hole records in Appendix H. The response zones were installed to target identified gas generation sources or migration pathways detailed in the initial preliminary CSM.

The soil sampling and analysis strategy was designed to characterise each encountered soil strata, permit an assessment of the potential contaminant linkages identified and investigate the geotechnical characteristics. In addition, samples were taken to allow for geo-environmental and geotechnical testing to be undertaken.

Soils collected for laboratory analysis were placed in a variety of containers appropriate to the anticipated testing suite required. They were dispatched to the laboratory in cool boxes under chain of custody documentation. Samples were stored in accordance with the RSK quality procedures to maintain sample integrity and preservation and to minimise the chance of cross contamination.

8.5 Monitoring programme

8.5.1 Ground gas monitoring

In line with the initial CSM, response zones were installed to target the sources or pathways as detailed in Table 12.

Three monitoring rounds have been undertaken to provide data to support refining of the CSM. The number of monitoring rounds undertaken is in general accordance with the decision matrix presented as Figure 6 of BS8576.

An infrared gas meter was used to measure gas flow, concentrations of carbon dioxide (CO₂), methane (CH₄) and oxygen (O₂) in percentage by volume, while hydrogen sulphide (H₂S) and carbon monoxide (CO) were recorded in parts per million.

Initial and steady state concentrations were recorded.

The atmospheric pressure before and during monitoring, together with the weather conditions, were recorded.

All ground gas monitoring results together with the temporal conditions are contained within Appendix I. Equipment calibration certificates are available on request.

8.6 Laboratory testing

Laboratory testing was undertaken at a UKAS accredited laboratory with ISO17025 and MCERTS accredited test methods were specified where applicable for contamination testing and as shown in the laboratory test certificates appended.

8.6.1 Chemical analysis of soil samples

The soil sampling strategy was designed to characterise natural strata typically within the upper 1.0m of the ground profile whilst also characterising deeper strata and the potential for contaminant migration from relevant sources of identified within the preliminary CSM.

The programme of chemical tests undertaken on soil samples obtained from the intrusive investigation is presented in Table 14 with the laboratory testing results contained in Appendix J.

Table 14 Summary of chemical testing of soil samples

Stratum	Tests undertaken	No. of tests
Topsoil	Asbestos screening and ID	13
	Heavy metals	3
	Contamination suite (heavy metals, PAH, TPH, BTEX, pH, SOM)	9
Made ground	Asbestos screening and ID	7
	Heavy metals	2
	Contamination suite (heavy metals, PAH, TPH, BTEX, pH, SOM)	5
Cohesive (clay)	Asbestos screening and ID	1
	Heavy metals	3
	Contamination suite (heavy metals, PAH, TPH, BTEX, pH, SOM)	6
	Non-pyritic BRE suite	12

8.6.2 Geotechnical analysis of soils

Where appropriate, disturbed and bulk soil samples were taken for geotechnical classification testing with the depth and nature of samples detailed within the exploratory hole records.

Where appropriate, testing was undertaken in accordance with BS 1377:1990 Method of Tests for Soils for Civil Engineering Purposes or, where superseded, by the relevant part of BS EN ISO 17892:2014 Geotechnical investigation and testing - Laboratory Testing of Soil. Tests carried out in order to classify the concrete class required on-site have been undertaken following the procedures within BRE SD1:2005.



The programme of geotechnical tests undertaken on samples obtained from the intrusive investigation is presented in Table 15. The results and UKAS accreditation of tests methods are shown in Appendix K.

Table 15 Summary of geotechnical testing undertaken

Strata	Tests undertaken	No. of tests
Cohesive (clay)	Moisture content %	6
	Liquid/ plastic limits	6
	Sieve analysis	6

8.6.3 Infiltration testing

Infiltration tests were carried out in three trial pits; TP03, TP04 and TP08, to establish the infiltration rate. The tests were carried out generally in accordance with the method described in BRE Digest 365 (BRE, 2016). This involved filling the pits with water from a tanker and recording the drop in water level with time as the water soaked into the ground.

Copies of the testing records are included in Appendix L.

9 SITE INVESTIGATION FACTUAL FINDINGS

The results of the intrusive investigation and subsequent geo-environmental and geotechnical laboratory analysis undertaken are detailed below.

9.1 Ground conditions encountered

The descriptions of the strata encountered, notes regarding visual or olfactory evidence of contamination, list of samples taken, field observations of soil and groundwater, in-situ testing and details of monitoring well installations are included on the exploratory hole records presented in Appendix H.

The exploratory holes revealed that the site is generally underlain by a topsoil over clay with sandstone/mudstone encountered at depth. This appears to confirm the stratigraphical succession described within the preliminary CSM. Made ground and coal was encountered in some locations.

For the purpose of discussion, the ground conditions encountered during the fieldworks are summarised in Table 16 with the strata discussed in subsequent subsections.

Table 16 General succession of strata encountered

Stratum	Exploratory holes encountered	Depth to top of stratum m bgl	Proven thickness (m)
Topsoil	All locations except TP201, TP202, WS102, WS105, HP03, HP05, BH104, BH105 – BH110	0	0.1 - 0.3
Made Ground	TP04, TP05, TP08, WS105, WS109, HP03, HP05	0 - 0.1	0.3 – 1.8
Cohesive (clay – weathered coal measures)	All locations except TP05	0 – 1.9	0.1 – 3.3
Granular (gravel – weathered coal measures)	TP01, TP05, TP201, TP202	0.15 – 0.95	0.35 – 1.3
Coal (Swallow Wood Seam)	TP07, WS101, WS102, WS106, WS107, WS110, BH101 – BH110	0.7 – 13.5	0.1 – 1.3
Mudstone, Siltstone, Sandstone (Pennine Middle Coal Measures)	All locations except TP04, TP08, TP201, TP202, WS111	0.7 – 3.6	0.05 – 28.6

9.1.1 Topsoil

Topsoil was encountered across the entire site and generally comprised a brown cohesive soil with a significant proportion of granular matrix and ranged in thickness from 0.1m to 0.3m.

9.1.2 Made Ground

Made ground was encountered in seven investigative locations and comprised both cohesive and granular matrix; the made ground ranged in thickness from 0.3m to 1.8m.

Within the field area made ground was proved in three trial pits between depth of 0.95m and 1.8m, the made ground was reworked natural ground with brick.

Made ground within the allotments comprised topsoil with some anthropogenic material such as ceramic, brick, glass and concrete from the allotment gardens.

9.1.3 Cohesive unit (clay – weathered coal measures)

This stratum was encountered from surface/beneath the made ground or topsoil and comprised a layer of slightly sandy, slightly gravelly clay (weathered coal measures) between 0.1m and 3.3m in thickness.

A summary of the in-situ and laboratory test results recorded in the stratum are presented in Table 17.

Table 17 Summary of in-situ and laboratory test results for cohesive unit

Soil parameters	Min. Value	Max. Value	Reference
Moisture content (%)	15	25	Appendix K
Liquid limit (%)	34	51	
Plasticity limit (%)	19	22	
Plasticity index (%)	15	30	
Plasticity term	Low	High	

9.1.4 Granular unit (gravel - weathered coal measures)

This stratum was encountered at a depth of between 0.15m and 0.95m below ground level and varies between 0.35 and 1.3m in thickness. Based on the site descriptions this layer can be described as a dense predominately granular soil, as a result of coal measures weathering.

9.1.5 Coal (Swallow Wood Coal)

Coal was encountered in sixteen investigative locations; at a depth of between 0.7m and 13.5m below ground level. The coal strata encountered varies between 0.1m and 1.3m in thickness. The coal was shallowest within the west and dipped towards the east.

No evidence of coal workings were encountered in any of the probeholes.

9.1.6 Pennine Middle Coal Measures

This stratum was encountered in most locations across the site; at a depth of between 0.7 and 3.6m below ground level and was proven to a maximum thickness of 28.6m. The Pennine Middle Coal Measures encountered comprised of mudstone, siltstone, sandstone and coal.

9.1.7 Visual/olfactory evidence of soil contamination

There was no visual or olfactory evidence of contamination within made ground deposits and underlying natural strata.

9.1.8 Asbestos Fragments

Within the allotment area, fragments of asbestos cement sheeting were noted within the undergrowth. The locations are marked on Figure 4.

Soil samples were collected from around the asbestos fragments to confirm if fibres were present in the soil.

9.2 Groundwater

9.2.1 Groundwater encountered during intrusive works

Localised groundwater was encountered during the intrusive investigation works as detailed on the logs in Appendix H. Groundwater was encountered at eight locations; TP04, TP08, BH101, BH103, BH104, BH105, BH106, BH107

9.2.2 Groundwater encountered during monitoring

Rest groundwater levels recorded during the monitoring programme are summarised in Table 18 based on the data provided in Appendix I.

Table 18 Summary of groundwater monitoring results

Monitoring well	Response zone stratum	Product thickness (m)	Groundwater depth (m bgl) – min.	Groundwater depth (m bgl) – max.
BH102	Pennine Middle Coal Measures	N/A	2.76	3.40
BH105		N/A	2.70	2.85
BH106		N/A	2.74	3.40
BH107		N/A	2.90	4.00
BH110		N/A	2.95	3.76
WS101	Clay – Weathered Coal Measures	N/A	Dry	
WS103		N/A	Dry	
WS105		N/A	Dry	3.07
WS107		N/A	Dry	1.00



Monitoring well	Response zone stratum	Product thickness (m)	Groundwater depth (m bgl) – min.	Groundwater depth (m bgl) – max.
WS110		N/A	Dry	0.34
WS111		N/A	Dry	1.0

It should be noted that groundwater levels might fluctuate for a number of reasons including seasonal variations. On-going monitoring would be required to establish both the full range of conditions and any trends in groundwater levels.

9.3 Chemical laboratory results

The soil testing results are presented in Appendix J.

Asbestos was not detected in soil screening; a total of twenty one soil samples were tested.

9.4 Geotechnical laboratory results

The results of the geotechnical testing are presented in Appendix K.

9.5 Ground gas monitoring

The results of the ground gas monitoring and testing carried out to date are given in Appendix I. A letter report will be produced on completion of gas monitoring which will detail all results and include a ground gas risk assessment.

10 GEO-ENVIRONMENTAL ASSESSMENT

10.1 Refinement of initial CSM

Potential sources of contamination in the form of made ground identified at the PRA stage were encountered in some locations during intrusive site works.

The natural ground conditions were the same as those anticipated within the CSM.

Groundwater was encountered during intrusive site works in some locations.

No potential pollutant linkages identified in the CSM have been eliminated at this stage.

10.2 Linkages for assessment

In line with CLR11 (Environment Agency, 2004), there are two stages of quantitative risk assessment, generic (GQRA) and detailed (DQRA). The GQRA comprises the comparison of soil, groundwater, soil gas and ground gas results with generic assessment criteria (GAC) that are appropriate to the linkage being assessed. This comparison can be undertaken directly against the laboratory results or following statistical analysis depending upon the sampling procedure that was adopted.

Following the refinement of the initial CSM, the potentially complete contaminant linkages that require further assessment and the methodology of assessment are presented in Table 19.

Table 19 Linkages for GQRA

Potentially relevant contaminant linkage	Assessment method
Soil	
1. Oral, dermal and inhalation exposure with impacted soil, soil vapour and dust by future residents	Human health GAC in Appendix M for a proposed residential end use with home-grown produce since the proposed end use includes residential gardens.
2. Inhalation exposure of future residents to asbestos fibres	Qualitative assessment based on the asbestos minerals present, their form, concentration, location and the nature of the proposed development.
3. Uptake of contaminants by vegetation potentially impacting plant growth (phytotoxicity)	Comparison of soil data to GAC in Appendix N for phytotoxicity.
4. Contaminants permeating potable water supply pipes	Comparison of soil data to GAC in Appendix O for plastic water supply pipes using UKWIR (2010) guidance.
5. Leaching of soil contaminants and dissolved phase migration	Since no leachate data is available the potential for leaching has been considered qualitatively using soil results.

Potentially relevant contaminant linkage	Assessment method
Ground Gas	
6. Concentrations of methane and carbon dioxide in ground gas entering and accumulating in enclosed spaces or small rooms in new buildings, which could affect future site users. For methane this could create a potentially explosive atmosphere, while death by asphyxiation could result from carbon dioxide.	Gas screening values (GSV) have been calculated using maximum methane and carbon dioxide concentrations with maximum flow rates recorded at the site. The GSV have been compared with the revised Wilson and Card classification presented in BS8485.

10.3 Methodology and assessment of soil results

The analysis of laboratory results relating to soil samples submitted for testing, including leachate analysis, is included in the following sections.

10.3.1 Oral, dermal and inhalation exposure with impacted soil by future occupants/site users

The soil results have been directly compared against the GAC for residential with home-grown produce end use.

A soil organic matter (SOM) of 6% has been selected since laboratory results within the samples average at 10.04%. The soil screening output spreadsheet is presented as Appendix P. Any exceedances within the results are highlighted in red on the screening output spreadsheet.

Assessment of the results indicates three exceedances of the GAC for the suite of contaminants tested, these are all located within the allotment area. These are summarised below.

- Arsenic (GAC 37mg/kg) 50mg/kg in WS111 at 0.4-0.5m bgl.
- Lead (GAC 200mg/kg) 205mg/kg in WS107 at 0-0.1m bgl.
- Lead (GAC 200mg/kg) 354mg/kg in WS110 at 0-0.1m bgl.

Given these exceedances are marginal and located within the upper 0.5m strata, it is anticipated that no significant risk is posed and it is likely that these soils will be removed from site during levelling/digging of foundations or isolated below a suitable thickness of soil.

Based on the laboratory testing topsoil within the field area is suitable for reuse within a residential development.



10.3.2 Inhalation exposure of future occupants/site users to asbestos fibres

The visual inspection at the laboratory identified no materials suspected of potentially containing asbestos and the scheduled laboratory screening for asbestos found no detectable asbestos fibres within the samples of made ground and natural soils, this includes the soil around the asbestos fragments.

10.3.3 Uptake of contaminants by vegetation potentially inhibiting plant growth (phytotoxicity)

The results have been compared with the GAC presented in Appendix N for this linkage. The results indicate that a relevant contaminant linkage is unlikely to exist associated with phytotoxic effects.

10.3.4 Impact of organic contaminants on potable water supply pipes

For initial assessment purposes, the results of the investigation have been compared with the GAC presented in Appendix O for this linkage, which are reproduced from *UKWIR Report 10/WM/03/21. Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites* (UKWIR, 2010).

The results indicate that a relevant linkage may exist associated with organic contaminants and therefore pollutant polyethylene (PE) water supply pipes are expected to be unsuitable for use on the development unless remedial measures are implemented that mitigate the risk. Polyvinyl chloride (PVC) water supply pipes are expected to be suitable.

It should be noted that at the time of this investigation the future routes of water supply pipes had not been established, hence the investigation and sampling strategy may not be fully compliant with UKWIR recommendations. Consequently, a targeted investigation and specific sampling/analytical strategy may be required at a later date once the route(s) of the supply pipe(s) is/are known. In addition, it is recommended that the relevant water supply company be contacted at an early stage to confirm its requirements for assessment, which may not necessarily be the same as those recommended by UKWIR.

10.3.5 Leaching of contaminants and dissolved phase migration

Soil samples were not analysed for leachable PAH or TPH. However, the concentrations of PAH and TPH, particularly the more mobile and persistent compounds, indicate that leaching to groundwater is unlikely to be a relevant pollutant linkage; however, further assessment may be required.

10.4 Ground gas risk assessment

The site investigation and subsequent gas monitoring undertaken to date provides some evidence for an initial assessment. However, due to an incomplete monitoring programme and not capturing 'worse case' conditions there remains uncertainty around the ground gas regime and as such it is recommended that further ground gas monitoring rounds are undertaken to enable the confident assessment of risk and subsequent design of appropriate gas protection measures for the proposed development.



Three rounds of gas monitoring data have been collected to date and the results are shown in Appendix I.

An addendum gas risk assessment letter report will be issued to confirm the findings upon completion of all monitoring visits. Initial readings from gas monitoring to date RSK indicate no methane and low carbon dioxide concentrations with a maximum reading of 3.7%. Negligible flow was recorded across the site.

11 COAL MINING ASSESSMENT

11.1 Background

The site is located in an area determined as high risk for mine workings, due to the outcrop of a workable coal seam (Swallow Wood Coal) within the site, for further details refer to the Coal Mining Risk Assessment, which is summarised in Section 4.

The Swallow Wood Coal, recorded as 0.3m thick in working to the South, is projected to outcrop within the South West of the site and dips down towards the West, therefore a large proportion of the site will be underlain by shallow coal.

11.2 Mining Investigation

The mining investigation comprised the drilling of ten probeholes, probehole locations are shown on Figure 4.

Probehole BH101 was drilled to a depth 30m close to the outcrop to determine the presence of the Shallow Wood Coal and any other deeper seams. The Swallow Wood Coal was encountered at 9.2m bgl, with a seam thickness of 0.7m, no other coal was proved.

Six probeholes (BHs 102 to 107) were drilled down dip of BH101 to prove the Shallow Wood Coal, coal was encountered at depths between 9.6m and 13.5m, with a seam thickness varying between 0.7m and 1.0m.

To the West of BH101, three probeholes were drilled (BH108 to BH110) in the allotment area. Coal was proved at its shallowest in BH108 in two thin leaves at 1.5m (0.3m thick) and 6.5m (0.1m thick). Two leaves were also proved in BH109 at 2.5m (0.5m thick) and 8.3m (0.2m thick). Coal was recorded in BH110 as being 1.3m thick at a depth of 6.4m.

No loss of flush, or broken ground was recorded in any of the probeholes.

A thin weathered seam of coal (0.1m to 0.3m) was proved in TP7, WS101 and WS102 at shallow depths between 0.7m and 2.3m bgl.

11.3 Discussion/Conclusion

Coal encountered within the probeholes is considered to be the shallow Wood Coal seam, with the encountered seam thickness, similar to the recorded seam thickness in the opencast workings to the South of the site.

No evidence of underground coal workings were noted within any of the probeholes.

However, the possibility of localised bell pitting cannot be entirely discounted, therefore it is recommended that a watching brief for evidence of coal workings should be undertaken during the topsoil strip across the site.

12 GEOTECHNICAL ASSESSMENT

12.1 Proposed development

It is understood that the proposed development is to involve the construction of residential properties and associated infrastructure. At this stage no specific information relating to building loads has been provided.

12.2 Foundation options

12.2.1 General suitability

Given the presence of competent natural ground at a relatively shallow depth it is considered that traditional spread footings will be suitable for the proposed development.

It is considered that the weathered coal measures have an allowable bearing capacity of at least 100kN/m².

12.2.2 Foundation works risk assessment

It is anticipated that a foundation works risk assessment report will not be required for the development because:

- the type of foundation proposed does not have the potential to create preferential pathways for migration of ground gas to surface or groundwater to depth

12.2.3 Floor slabs

The nature of the soils encountered during the investigation indicates that ground bearing floor slabs may be adopted with a suitable sub-base layer for the proposed development.

Where localised made ground is present in the field area, suspended floor slabs will be required.

All formation levels should be proof-rolled and all topsoil and any other loose, soft, organic or otherwise unsuitable materials should be removed and replaced with well-compacted, suitable granular fill.

12.3 Excavations for foundations and services

Generally, the trial pits remained stable during excavation which indicates that foundation excavations should also remain stable in the short term. In the event that excavations are to remain open for longer periods, consideration should be given to the use of trench support systems.

Man entry into any excavations should not be undertaken without provision of suitable shoring and support and dewatering or suitable regrading and battering of side slopes to safe angles. Confined spaces protocols for the Health and Safety of personnel should always be used where man entry into excavations is to be undertaken as low oxygen conditions may be present.



Slight inflow of groundwater was encountered in some of the trial pits, it is note expected that excavation will require groundwater pumping.

Excavation with the weathered coal measures and bedrock should be possible using conventional site plant.

Coal could be encountered in foundation excavations within the allotment area and also within the far East of the site. Where coal is encountered in foundation excavations, the excavation will require deepening through the coal into the underlying strata.

12.4 Chemical attack on buried concrete

This assessment of the potential for chemical attack on buried concrete at the site is based on BRE Special Digest 1: Concrete in aggressive ground, which represents the most up-to-date guidance on this topic currently available in the UK.

The desk study and site reconnaissance indicate that, for the purposes of assessing the aggressive chemical environment of the site, the site should be considered as comprising natural ground unlikely to contain pyrite.

The results of the laboratory analysis undertaken on samples of natural strata indicate 2:1 water / soil extract water soluble sulphate contents ranging from <10mg/l to 90mg/l, giving a characteristic value (mean of the highest two sulphate results) for water soluble sulphate of 65mg/l; and pH value ranging from 5.06 to 8.52 giving a characteristic pH value of 6.4.

These results indicate that, in accordance with *BRE Special Digest 1: 2005 Concrete in aggressive ground* (BRE, 2005), the Design Sulphate Class for the site of DS-1. This assumes nominally mobile groundwater conditions and that no significantly disturbed clay comes into contact with concrete foundations or structures.

The corresponding ACEC classification for the site is AC-1, based on an assumption of mobile groundwater conditions, and a characteristic pH value of 6.4.

12.5 Infiltration drainage

The results of the infiltration testing were variable across the site, with the results summarised in Table 20 below.

Table 20 Summary of infiltration testing results

Trial Pit Number #	Strata	Infiltration Rate (m/s)
TP03	Sandy gravelly clay / sandstone	7.53×10^{-6}
TP04	Made ground – clayey sandy gravel	3.56×10^{-8}
TP08	Sandy gravelly clay	2.38×10^{-5}

Notes: Data was extrapolated to obtain infiltration rates. Quickest infiltration rates from each pit has been presented.



Based upon the results of the soakaway tests presented above, the ground conditions appear unsuitable from a geotechnical viewpoint for the use of pit soakaways to discharge surface run-off water.

13 CONCLUSIONS AND RECOMMENDATIONS

13.1 Geo-environmental assessment

Based on the results of the site investigation and GQRA, the contaminant linkages that have been identified to be potentially complete and to require further action are:

1. Oral, dermal and inhalation exposure with impacted soil by future occupants/site users
2. Permeation of potential contaminants from soils or from perched groundwater into underground potable water supply service pipes
3. Migration and build-up of potential ground gas within on-site buildings

13.1.1 Oral, dermal and inhalation exposure with impacted soil by future occupants/site users

Within the allotment area some localised inorganic contamination was proved within the topsoil/made ground. This material will require removal or capping with at least 600mm of clean soil cover.

Asbestos cement sheeting within the allotment area will require removal during site clearance works.

Based on the laboratory testing topsoil within the field area is suitable for reuse within a residential development.

13.1.2 The permeation of organic contaminants from soils or into underground potable water supply service pipes in certain areas of the site

A relevant pollutant linkage may exist associated with the permeation of organic contamination to plastic water supply pipes. The depth and route of the proposed water supply pipe is not currently known. It is recommended that either PE pipe incorporating a metal barrier is adopted, or further work is completed to enable a full assessment of the suitability of pipe material or provide a zonation of the site to allow differing grades of pipe to be used as appropriate to the ground conditions.

It is recommended that the finding of this report be discussed with the local water provider to make sure that the criteria used are in agreement with their local requirements. If not additional testing may be required.

13.1.3 The migration and build-up of potential ground gas within on site buildings

A relevant pollutant linkage may exist associated with the build-up of ground gas within site buildings. Further gas monitoring rounds are yet to be conducted to investigate this linkage; an addendum gas risk assessment letter report will be issued to confirm the findings. Initial results show that no harmful levels of ground gas and negligible flow have been detected as the site.



13.2 Geotechnical assessment

Ground conditions generally comprise a cover of topsoil underlain by weathered coal measures (clay and gravel) and Pennine Middle Coal Measures bedrock.

Given the presence of competent natural ground at a relatively shallow depth it is considered that strip/trench foundations will be suitable for low rise residential development.

Buried concrete classification should be classed as DS-1 and AC-1.

It is anticipated from preliminary testing that the site is unsuitable for soakaways given the initial results.

13.3 Coal Mining Assessment

Ten probeholes were drilled across the site to prove the Shallow Wood Coal seam. The coal seam was encountered at depths between 0.7m and 13.5m, dipping from West to East.

No evidence of underground coal workings was noted during the investigation works.

The possibility of localised bell pitting cannot be discounted, therefore a watching brief for evidence of coal workings should be undertaken during the topsoil strip.

13.4 Recommendations

The following recommendations are made for further assessment of the site to address remaining uncertainties:

- Completion of ground gas monitoring programme (ongoing at present). To be reported as a separate ground gas risk assessment on completion of the monitoring works in December 2020.

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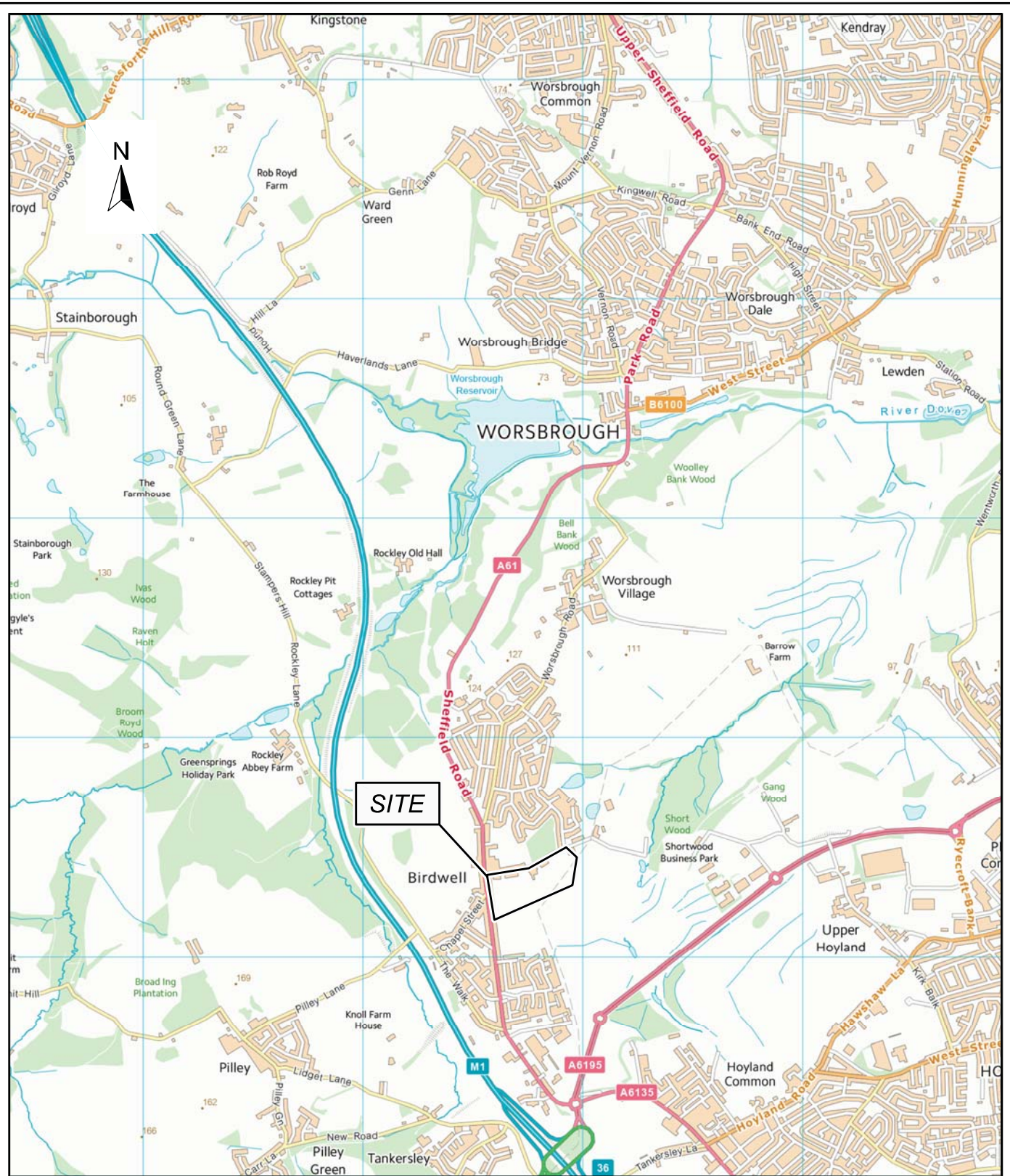
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FIGURES



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Client

Harworth Group

Project Title

Birdwell

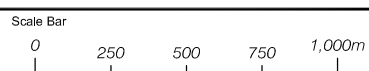
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SITE LOCATION PLAN

Rev	Drawn	Date	Checked	Date	Approved	Date
00	NP	29.11.19	LA	29.11.19	LA	29.11.19
Dimensions		Scale		Original Size		
m		1:25,000		A4		





Project Number
350283

Grid Ref
SE 347 013



Drawing Number
FIGURE 1


LEGEND:

-  Site boundary
-  Photograph and direction
-  Area of dense vegetation (no access)
-  Allotments (Limited Access)



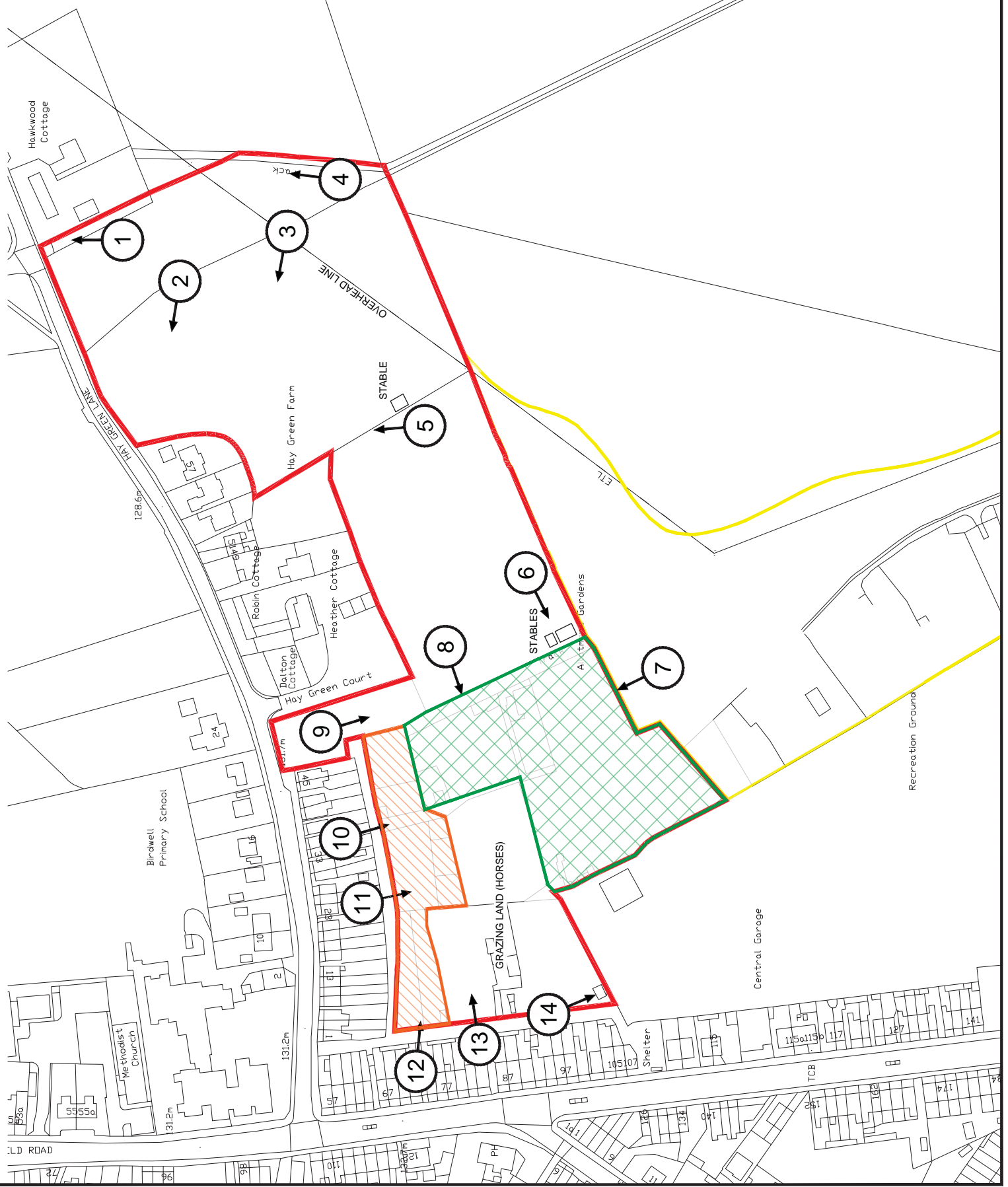
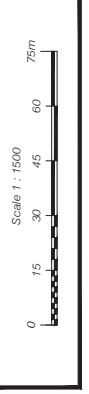
Notes
 Base plan from Gladman Development, Drawing No. 001, Dated 17.10.17

REV.	DATE	DESCRIPTION	BY	CHKD/APR.	NP	LA	LA
A	29.11.19	FIRST ISSUE					

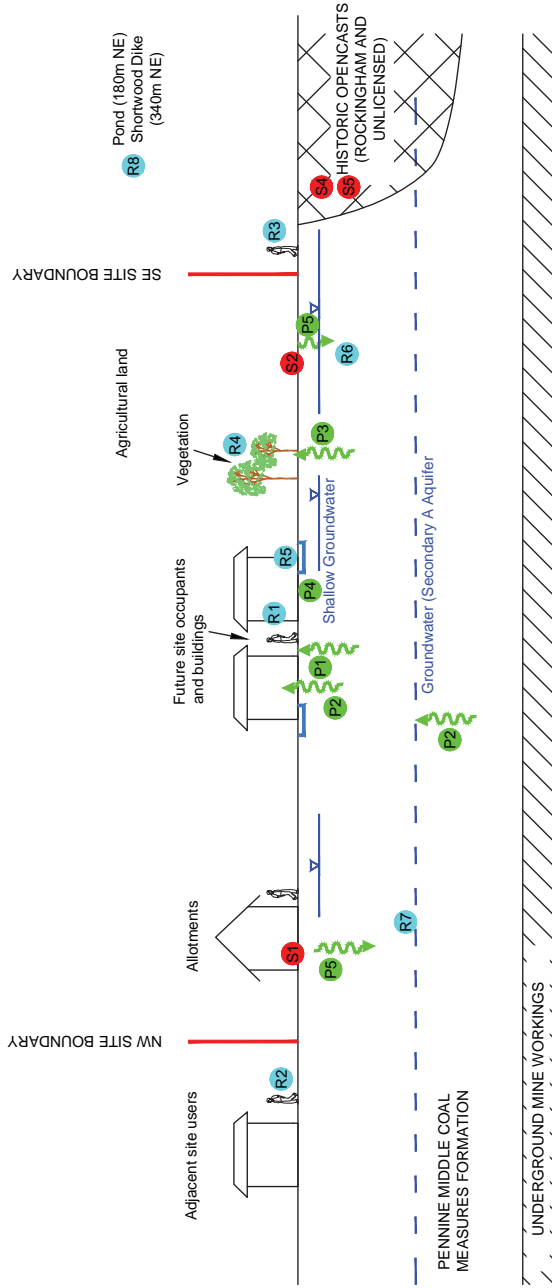
Dimensions	Projection	Scale	Orig Size
m		1:1500	A3



CLIENT	Harworth Group		
PROJECT	Birdwell		
TITLE	SITE FEATURE PLAN		
JOB NO.:	350283		
DRAWING FILE:	305283-R02(00)-FIG2		
BY:	DATE:	CONTRACT NO.:	REV.:
AP	29.11.19		FIGURE 2
			A



LEGEND:



SOURCES

On-site

- S1 Allotments
- S2 Agricultural land
- S3 Underlying Coal Measures strata

Off-site

- S4 Historic Rockingham opencast
- S5 Historic Unlicensed opencast

PATHWAYS

- P1 Direct contact (soil, dust and vegetable ingestion, dermal contact, dust and fibre inhalation)
- P2 Ground gas and soil gas accumulation and/or inhalation
- P3 Root uptake
- P4 Permeation of plastic water supply pipes
- P5 Leaching and vertical and lateral migration

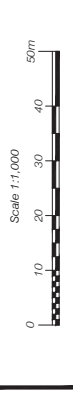
RECEPTORS

- R1 Future site occupants
- R2 Adjacent site users
- R3 Users of the public footpath along eastern boundary
- R4 Vegetation (proposed gardens and landscaped areas)
- R5 Potable water supply pipes
- R6 Shallow groundwater
- R7 Groundwater in Secondary A aquifer (PMCM bedrock)
- R8 Surface water receptors (pond and Shortwood Dike)

REV.	A	20.11.19	FIRST ISSUE	NP	LA	LA
DESCRIPTION						
BY	CHD/APR					
DATE						
Scale	nts					
Projection	A3					
Dimensions	m					



CLIENT	Harworth Group					
PROJECT	Birdwell					
TITLE	INITIAL CONCEPTUAL SITE MODEL					
JOB NO.:	350283					
DRAWING FILE:	305283-R02(00)-FIG3					
DATE:	29.11.19					
CONTRACT NO.:	FIGURE 3					
REV.:	A					



LEGEND:

- Site boundary
- Asbestos fragments
- Trial pit (SA - Soakaway test)
- Window sample borehole
- Rotary open hole
- Hand dug trial pit
- Gas well installed



Notes
 Base plan from Gladman Development, Drawing No. 001, Dated 17.10.17

REV.	DATE	DESCRIPTION	BY	CHKD/APR	Scale	Orig Size
A	21.08.20	FIRST ISSUE	NP	LA	LA	A3
DIMENSIONS			PROJECTION		Scale	Orig Size
m			1:1500		A3	



CLIENT	HARWORTH GROUP		
PROJECT	BIRDWELL		
TITLE	EXPLORATORY HOLE PLAN		
JOB NO.:	350283		
DRAWING FILE:	350283-R01(00)-FIG 4		
BY:	DATE:	CONTRACT NO.:	REV.:
HD	21.08.20	FIGURE 4	A





APPENDIX A

SERVICE CONSTRAINTS

1. This report and the site investigation carried out in connection with the report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) for Harworth Group (the "Client") in accordance with the terms of a contract [RSK Environment Standard Terms and Conditions] between RSK and the Client, dated 29 November 2019. The Services were performed by RSK with the reasonable skill and care ordinarily exercised by an environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the Client.
2. Other than that, expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.
3. Unless otherwise agreed in writing, the Services were performed by RSK exclusively for the purposes of the Client. RSK is not aware of any interest of or reliance by any party other than the Client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. **Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.**
4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK 's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date of this report, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.
5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the Client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.
6. The observations and conclusions described in this report are based solely upon the Services which were provided pursuant to the agreement between the Client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off the site of asbestos, invasive plants, electromagnetic fields, lead paint, heavy metals, radon gas or other radioactive or hazardous materials, unless specifically identified in the Services.
7. The Services are based upon RSK's observations of existing physical conditions at the Site gained from a visual inspection of the site together with RSK's interpretation of information, including documentation, obtained from third parties and from the Client on the history and usage of the site, unless specifically identified in the Services or accreditation system (such as UKAS ISO 17020:2012 clause 7.1.6):



- a. The Services were based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely.
- b. The Services were limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the visual inspection.
- c. The Services did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services.

RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the Client and RSK.

8. The intrusive environmental site investigation aspects of the Services are a limited sampling of the site at pre-determined locations based on the known historic / operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the properties of the materials adjacent and local conditions, together with the position of any current structures and underground utilities and facilities, and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters (as stipulated in the scope between the client and RSK, based on an understanding of the available operational and historical information) and it should not be inferred that other chemical species are not present.
9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (intrusive and sample locations etc) annotated on site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for setting out and should be considered indicative only.
10. The comments given in this report and the opinions expressed are based on the ground conditions encountered during the site work and on the results of tests made in the field and in the laboratory. However, there may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account. In particular, it should be noted that there may be areas of made ground not detected due to the limited nature of the investigation or the thickness and quality of made ground across the site may be variable. In addition, groundwater levels and ground gas concentrations and flows, may vary from those reported due to seasonal, or other, effects and the limitations stated in the data should be recognised.
11. Asbestos is often observed to be present in soils in discrete areas. Whilst asbestos-containing materials may have been locally encountered during the fieldworks or supporting laboratory analysis, the history of brownfield and demolition sites indicates that asbestos fibres may be present more widely in soils and aggregates, which could be encountered during more extensive ground works.
12. Unless stated otherwise, only preliminary geotechnical recommendations are presented in this report and these should be verified in a Geotechnical Design Report, once proposed construction and structural design proposals are confirmed.



APPENDIX B

SUMMARY OF LEGISLATION AND POLICY RELATING TO CONTAMINATED LAND

Part IIA of the Environmental Protection Act 1990

Part IIA of the Environmental Protection Act 1990 (Part IIA) and its associated Contaminated Land Regulations 2000 (SI 2000/227), which came into force in England on 1 April 2000, formed the basis for the current regulatory framework and the statutory regime for the identification and remediation of contaminated land. Part IIA of the EPA 1990 defines contaminated land as 'any land which appears to the Local Authority in whose area it is situated to be in such a condition by reason of substances in, on or under the land, that significant harm is being caused, or that there is significant possibility of significant harm being caused, or that pollution of controlled waters is being or is likely to be caused'. Controlled waters are considered to include all groundwater, inland waters and estuaries.

In August 2006, the Contaminated Land (England) Regulations 2006 (SI 2006/1380) were implemented, which extended the statutory regime to include Part IIA of the EPA as originally introduced on 1 April 2000, together with changes intended chiefly to address land that is contaminated by virtue of radioactivity. These have been replaced subsequently by the Contaminated Land (England) (Amendment) Regulations 2012, which now exclude land that is contaminated by virtue of radioactivity.

The intention of Part IIA is to deal with contaminated land issues that are considered to cause significant harm on land that is not undergoing development (see Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance, April 2012). This document replaces Annex III of Defra Circular 01/2006, published in September 2006 (the remainder of this document is now obsolete).

Planning Policy

Contaminated land is often dealt with through planning because of land redevelopment. This approach was documented in Planning Policy Statement: Planning and Pollution Control PPS23, which states that it remains the responsibility of the landowner and developer to identify land affected by contamination and carry out sufficient remediation to render the land suitable for use. PPS23 was withdrawn early in 2012 and has been replaced by much reduced guidance within the National Planning Policy Framework (NPPF), reference ISBN: 978-1-5286-1033-9, February 2019.

The new framework has only limited guidance on contaminated land, as follows:

Chapter 11. Making effective use of land

117 Planning policies and decisions should promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions. Strategic policies should set out a clear strategy for accommodating objectively assessed needs, in a way that makes as much use as possible of previously-developed or 'brownfield' land.

118. Planning policies and decisions should:



c) give substantial weight to the value of using suitable brownfield land within settlements for homes and other identified needs, and support appropriate opportunities to remediate despoiled, degraded, derelict, contaminated or unstable land.

Chapter 15. Conserving and enhancing the natural environment

170. Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and

f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

Ground conditions and pollution

178. Planning policies and decisions should ensure that:

a) a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation);

b) after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990; and

c) adequate site investigation information, prepared by a competent person, is available to inform these assessments.

179. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

Water Resources Act (WRA)

The Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009 updated the Water Resources Act 1991, which introduced the offence of causing or knowingly permitting pollution of controlled waters. The Act provides the Environment Agency with powers to implement remediation necessary to protect controlled waters and recover all reasonable costs of doing so.

Water Framework Directive (WFD)

The Water Framework Directive 2000/60/EC is designed to:

- enhance the status and prevent further deterioration of aquatic ecosystems and associated wetlands that depend on the aquatic ecosystems
- promote the sustainable use of water
- reduce pollution of water, especially by 'priority' and 'priority hazardous' substances
- ensure progressive reduction of groundwater pollution.



The WFD requires a management plan for each river basin be developed every six years.

Groundwater Directive (GWD)

The 1980 Groundwater Directive 80/68/EEC and the 2006 Groundwater Daughter Directive 2006/118/EC of the WFD are the main European legislation in place to protect groundwater. The 1980 Directive is due to be repealed in December 2013. The European legislation has been transposed into national legislation by regulations and directions to the Environment Agency.

Priority Substances Directive (PSD)

The Priority Substances Directive 2008/105/EC is a 'Daughter' Directive of the WFD, which sets out a priority list of substances posing a threat to or via the aquatic environment. The PSD establishes environmental quality standards for priority substances, which have been set at concentrations that are safe for the aquatic environment and for human health. In addition, there is a further aim of reducing (or eliminating) pollution of surface water (rivers, lakes, estuaries and coastal waters) by pollutants on the list. The WFD requires that countries establish a list of dangerous substances that are being discharged and EQS for them. In England and Wales, this list is provided in the River Basin Districts Typology, Standards and Groundwater threshold values (Water Framework Directive) (England and Wales) Directions 2010. In order to achieve the objectives of the WFD, classification schemes are used to describe where the water environment is of good quality and where it may require improvement.

Environmental Permitting Regulations (EPR)

The Environmental Permitting (England and Wales) Regulations 2016 (as amended) provide a single regulatory framework that streamlines and integrates waste management licensing, pollution prevention and control, water discharge consenting, groundwater authorisations, and radioactive substances regulation. Schedule 22, paragraph 6 of EPR 2016 states: 'the regulator must, in exercising its relevant functions, take all necessary measures - (a) to prevent the input of any hazardous substance to groundwater; and (b) to limit the input of non-hazardous pollutants to groundwater so as to ensure that such inputs do not cause pollution of groundwater.'

Notes:

- 1. The above information is provided for background but does not constitute site-specific advice*
- 2. The above summary applies to England only. Variations exist within other countries of the United Kingdom*



APPENDIX C

ENVIRONMENTAL DATABASE REPORT

Historical Mapping Legends

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

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

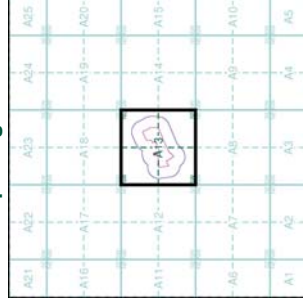
Large-Scale National Grid Data 1:2,500 and 1:1,250



Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Yorkshire	1:2,500	1893	2
Yorkshire	1:2,500	1905 - 1906	3
Yorkshire	1:2,500	1931	4
Ordnance Survey Plan	1:2,500	1962	5
Additional SIMs	1:2,500	1971	6
Large-Scale National Grid Data	1:2,500	1988 - 1990	7
Large-Scale National Grid Data	1:2,500	1993	8
Large-Scale National Grid Data	1:2,500	1996	9

Historical Map - Segment A13



Order Details

Order Number: 224076250_1_1
 Customer Ref: 350283
 National Grid Reference: 434780, 401350
 Slice: A
 Site Area (Ha): 4.01
 Search Buffer (m): 100

Site Details

Hay Green Lane, Birdwell, BARNESLEY, S70 5XD



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Yorkshire

Published 1893

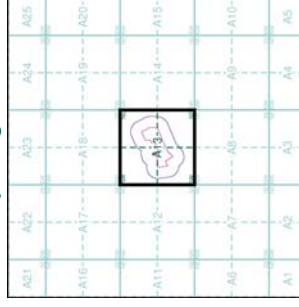
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held in the Ordnance Survey archives for England, Wales and Scotland in the 1940s. In 1864, the Ordnance Survey published a series of maps of the county of Yorkshire, which covered the whole of what was then considered to be the delineated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

282_03	1893	1:2,500
282_04	1893	1:2,500
282_07	1893	1:2,500
282_08	1893	1:2,500

Historical Map - Segment A13



Order Details

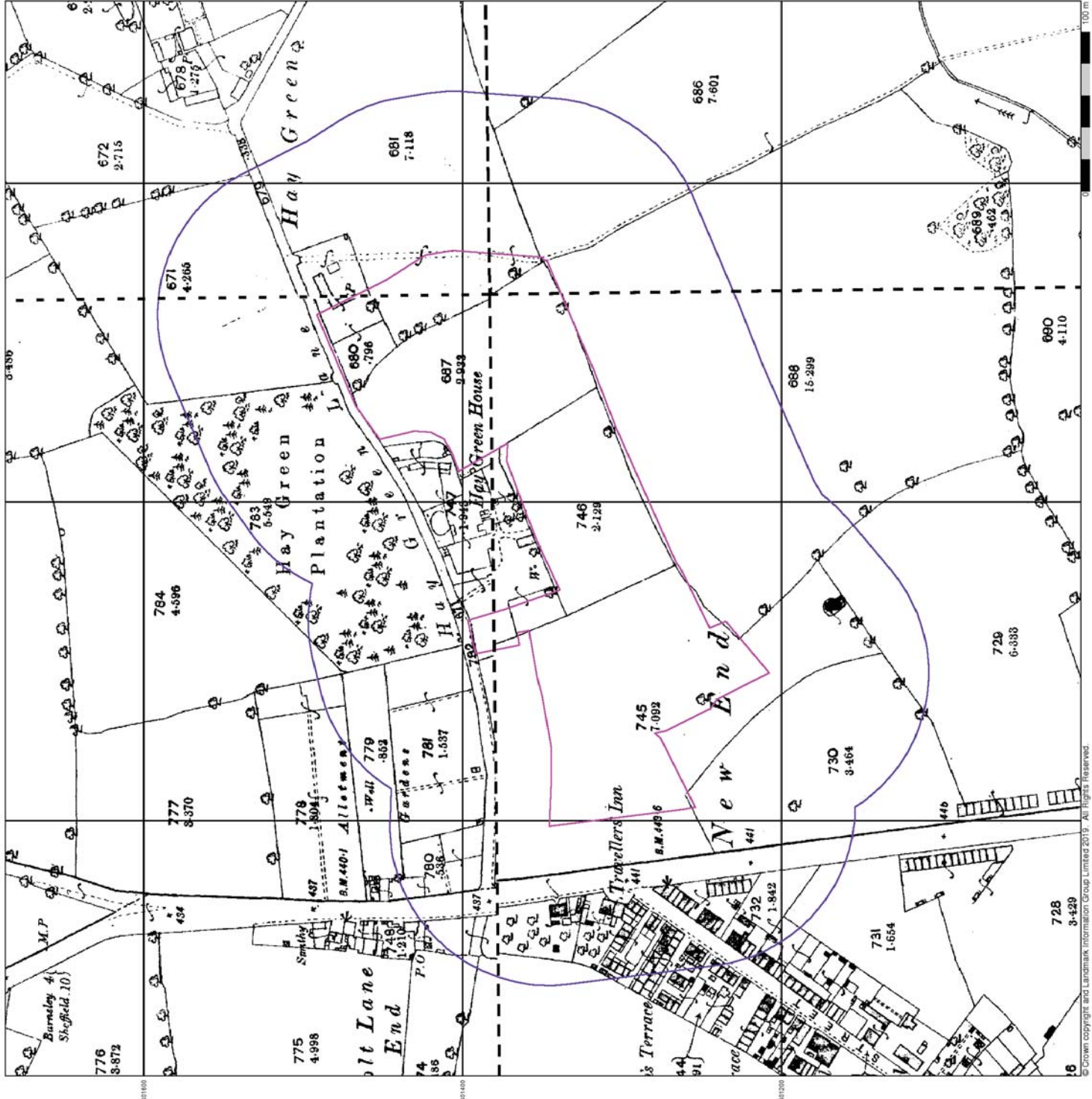
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 Customer Ref: 350283
 National Grid Reference: 434780, 401350
 Slice: A
 Site Area (Ha): 4.01
 Search Buffer (m): 100

Site Details

Hay Green Lane, Birdwell, BARNSLLEY, S70 5XD



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 Fax: 0844 844 9551
 Web: www.envirocheck.co.uk

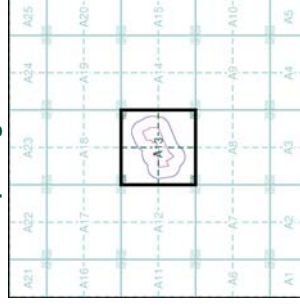


The historical maps shown were reproduced from maps predominantly held at the Ordnance Survey offices in London in the 1940s. In 1864, the Ordnance Survey adopted the metric system for its maps. It covered the whole of what was then considered to be the populated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

282_03	282_04	282_06
1906	1905	1905
1:2,500	1:2,500	1:2,500

Historical Map - Segment A13

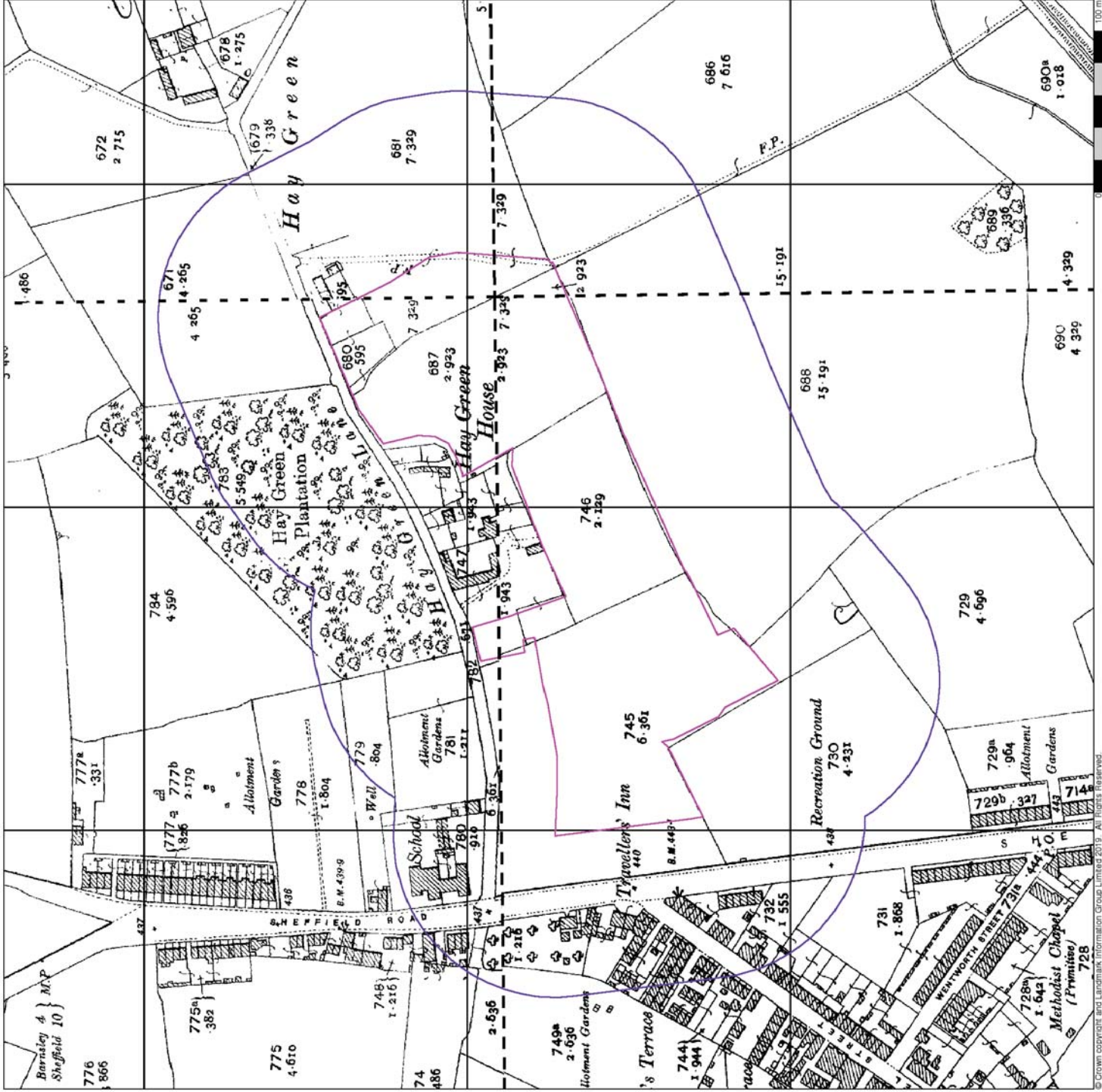


Order Details

Order Number: 224076250_1_1
 Customer Ref: 350283
 National Grid Reference: 434780, 401350
 Slice: A
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 Search Buffer (m): 100

Site Details

Hay Green Lane, Birdwell, BARNSELEY, S70 5XD

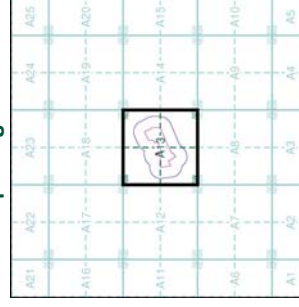


The historical maps shown were reproduced from maps predominantly held at a 1:2,500 scale in England, Wales and Scotland in the 1940s. 1864 was adopted for England, Wales and Scotland, and 1888 for Scotland. The published date given below is often some years later than the surveyed date. Before 1938 all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

282_03	282_04	282_06
1931	1931	1931
1:2,500	1:2,500	1:2,500

Historical Map - Segment A13

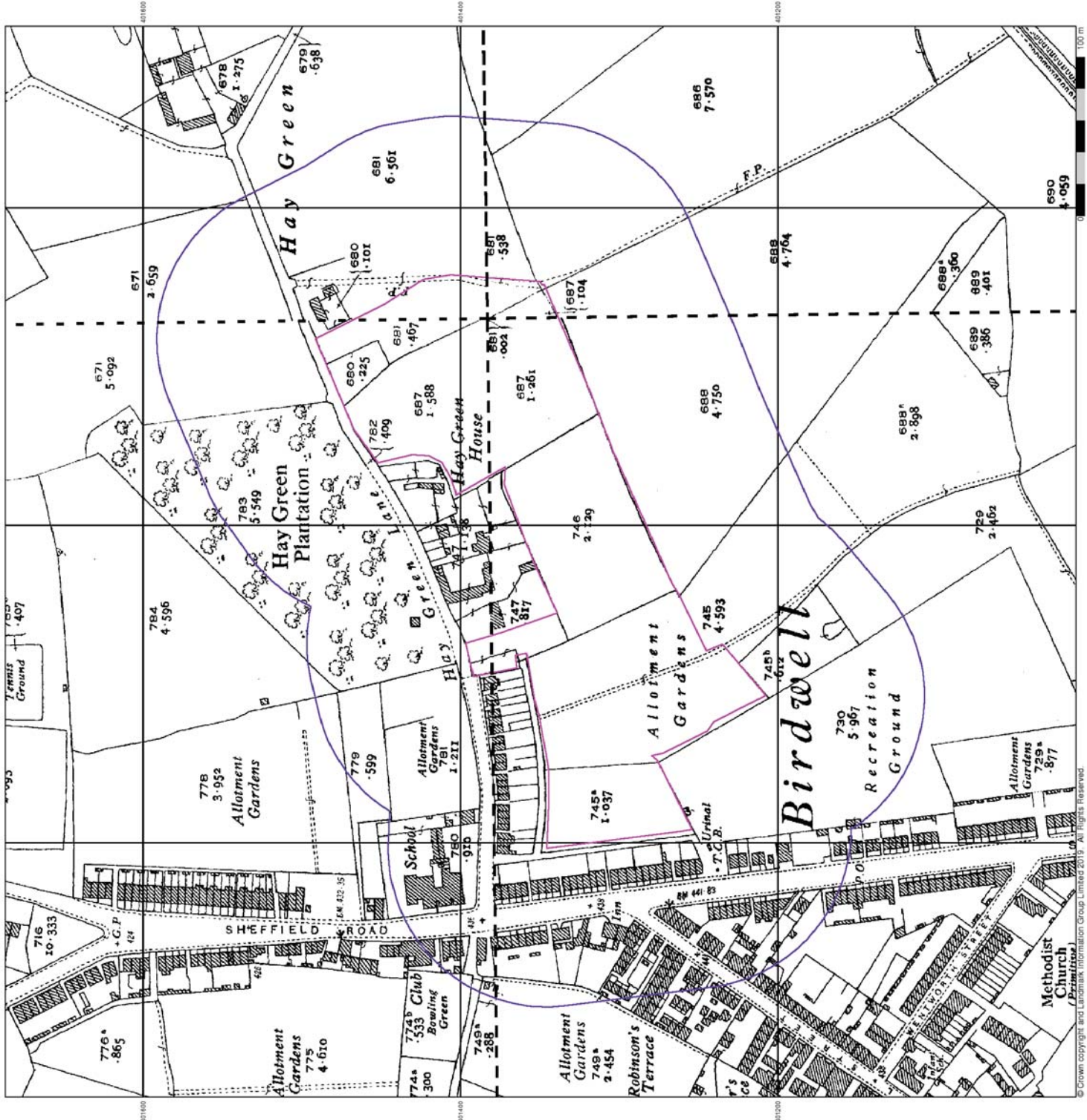


Order Details

Order Number: 224076250_1_1
 Customer Ref: 350283
 National Grid Reference: 434780, 401350
 Slice: A
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 Search Buffer (m): 100

Site Details

Hay Green Lane, Birdwell, BARNESLEY, S70 5XD



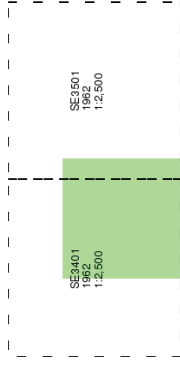


Ordnance Survey Plan Published 1962

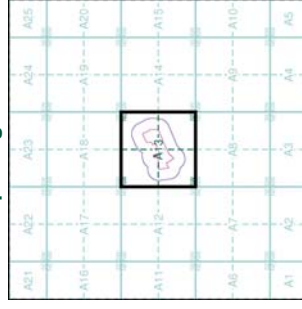
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at a scale of 1:2,500 for England, Wales and Scotland in the 1940s. In 1962, the Ordnance Survey published a new edition of the OS grid covering the whole of what was then considered to be the populated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

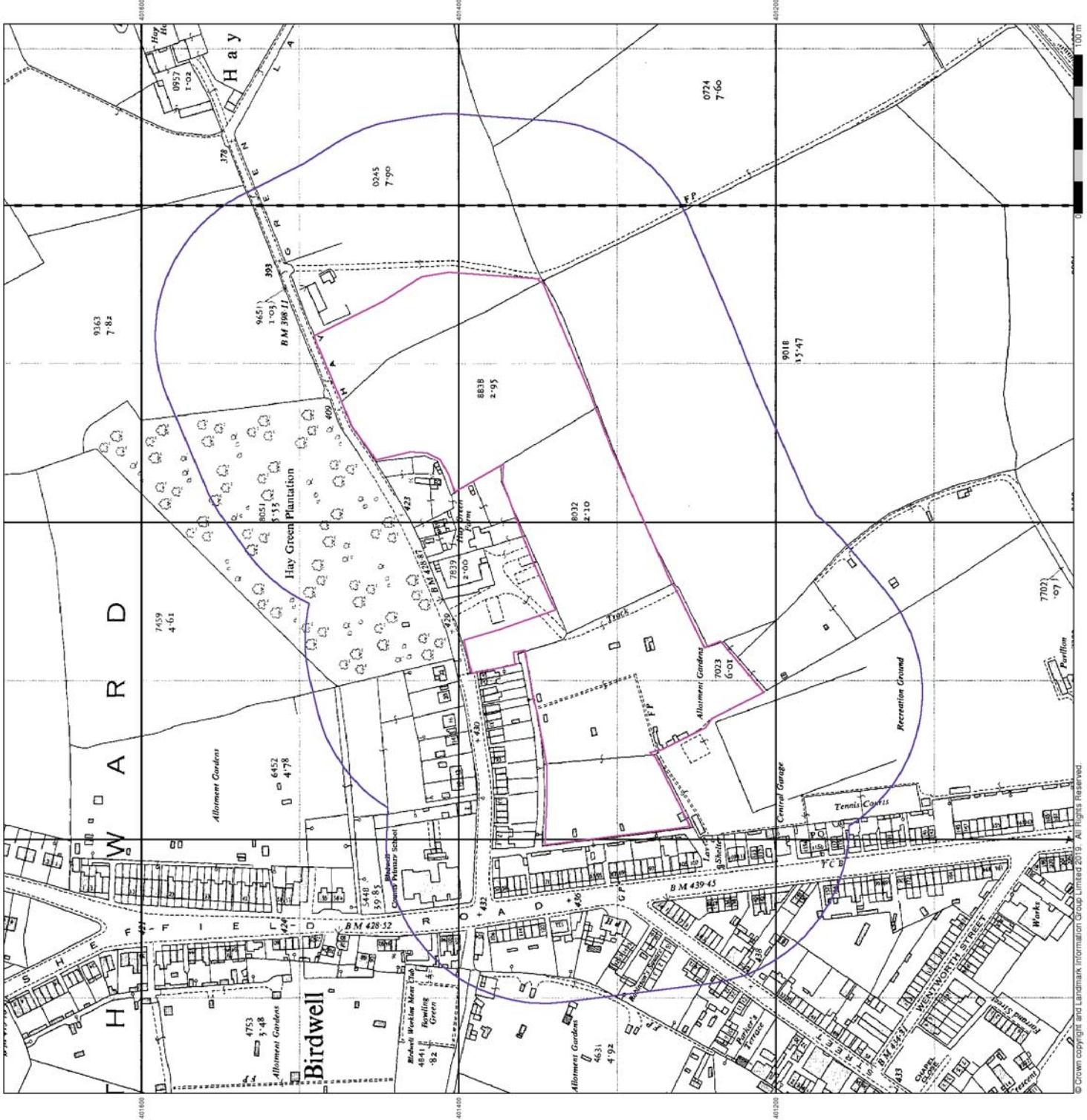
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Customer Ref: 350283
National Grid Reference: 434780, 401350
Slice: A
Site Area (Ha): 4.01
Search Buffer (m): 100

Site Details

Hay Green Lane, Birdwell, BARNESLEY, S70 5XD



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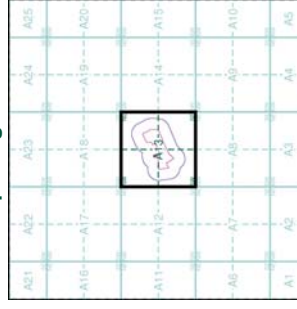
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the Ordnance Survey offices in England, Wales and Scotland in the 1940s. 1864 maps were adopted for England, Wales and Scotland in the 1940s. 1864 maps were reproduced from the original maps published by 1868. It covered the whole of what was then considered to be the delineated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938 all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

SE3401	1971	1:2,500
SE3501	1971	1:2,500

Historical Map - Segment A13

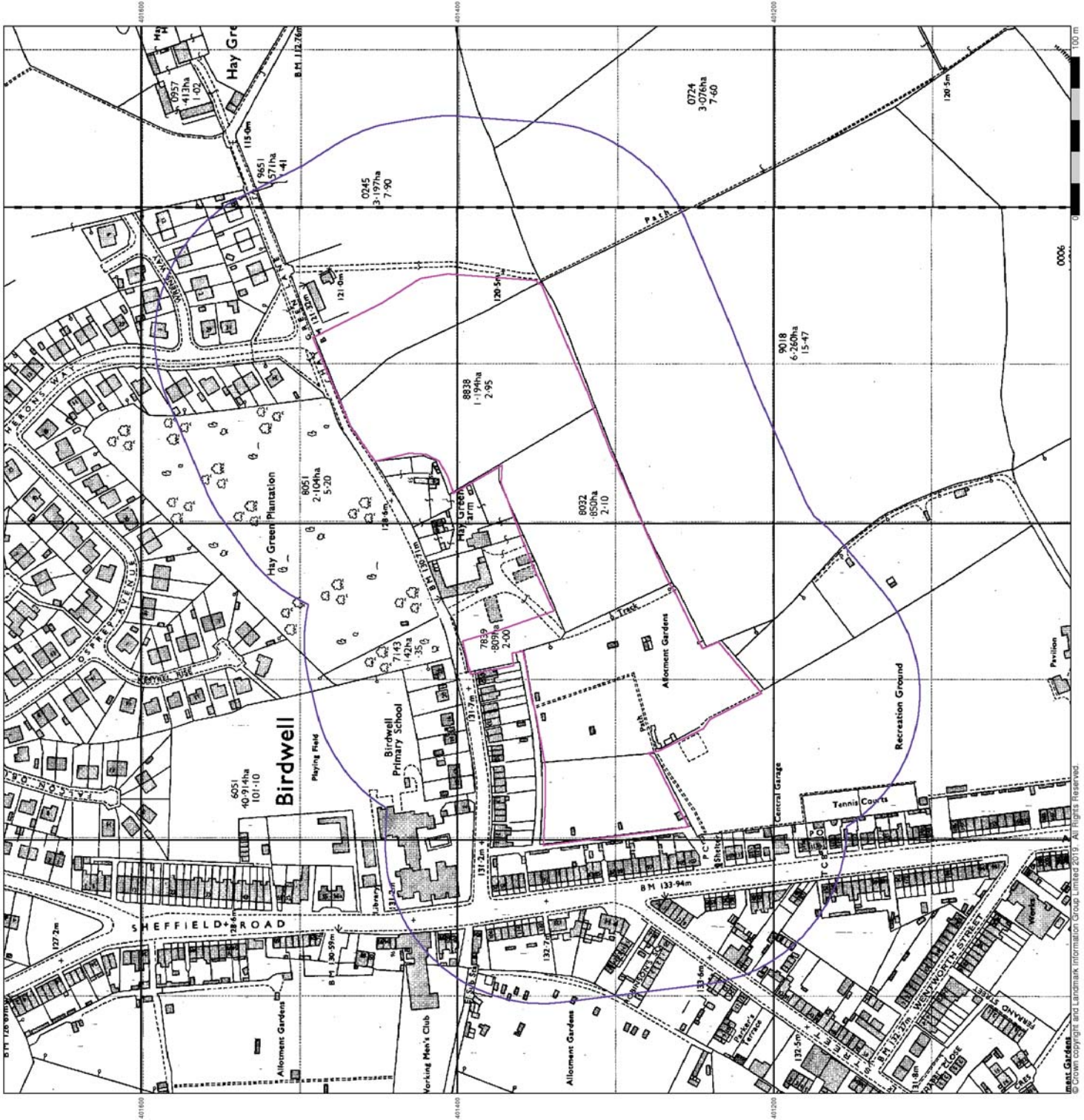


Order Details

Order Number: 224076250_1_1
 Customer Ref: 350283
 National Grid Reference: 434780, 401350
 Slice: A
 Site Area (Ha): 4.01
 Search Buffer (m): 100

Site Details

Hay Green Lane, Birdwell, BARNESLEY, S70 5XD





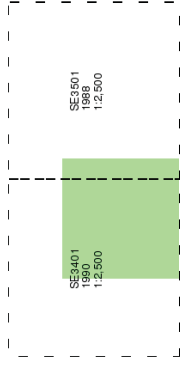
Additional SIMS

Published 1988 - 1990

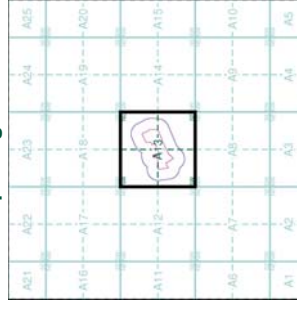
Source map scale - 1:2,500

The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are the first aerial photography mapping which were produced and published in 1947 to be the first to contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

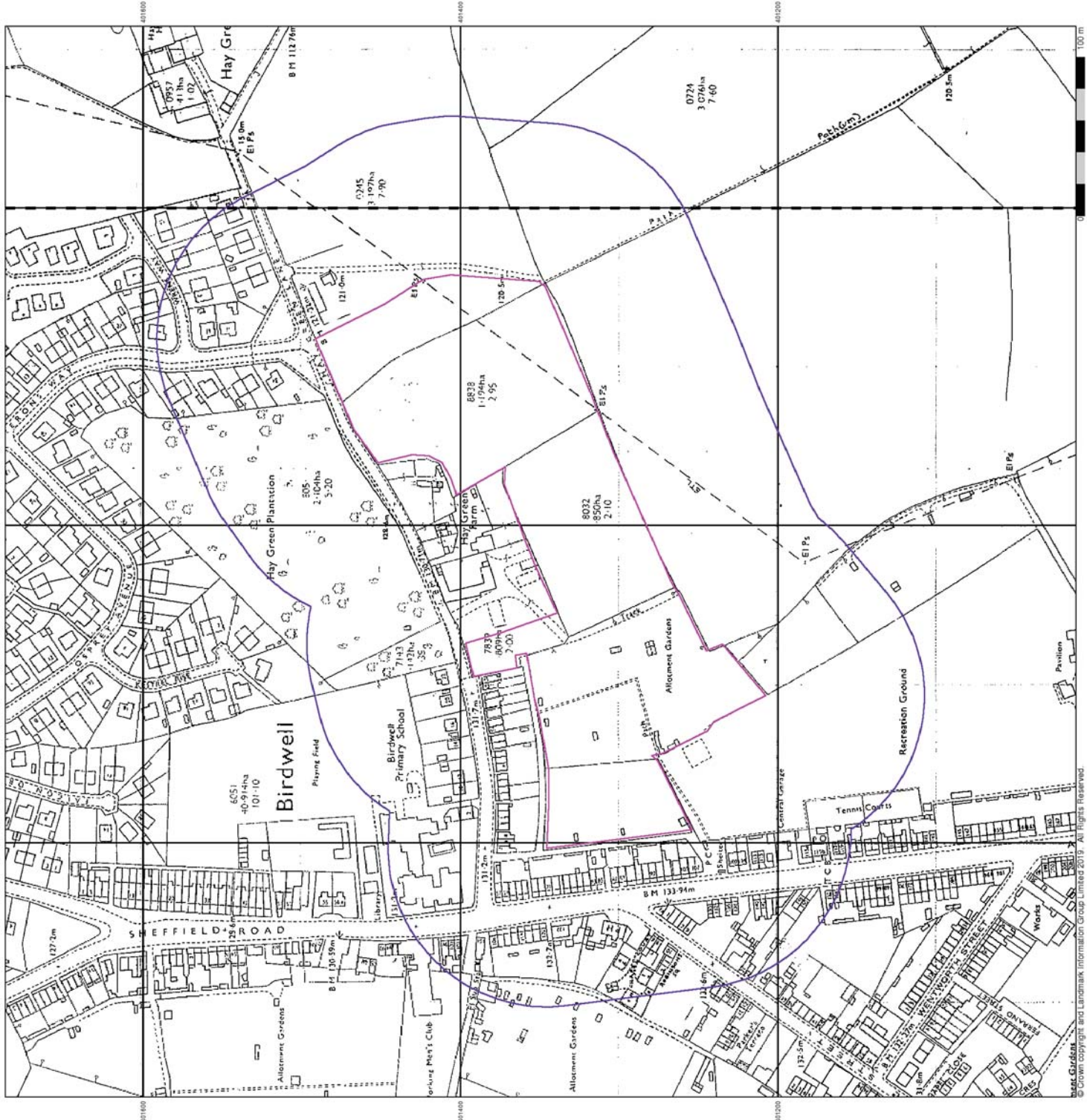
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 Customer Ref: 350283
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 Slice: A
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 Search Buffer (m): 100

Site Details

Hay Green Lane, Birdwell, BARNESLEY, S70 5XD



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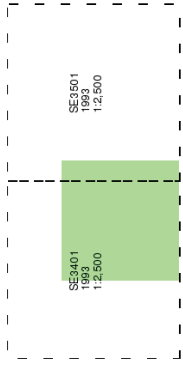
Large-Scale National Grid Data

Published 1993

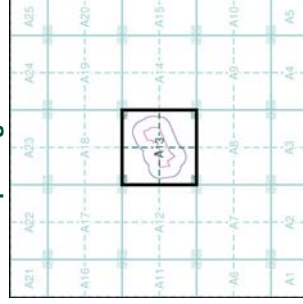
Source map scale - 1:2,500

Large Scale National Grid Data superseded SIM cards (Ordnance Survey's information on microfilm) in 1992, and continued to be produced until 1999. They provide a grid reference for each 100m square and provide detailed information on buildings and roads, but tend to miss topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

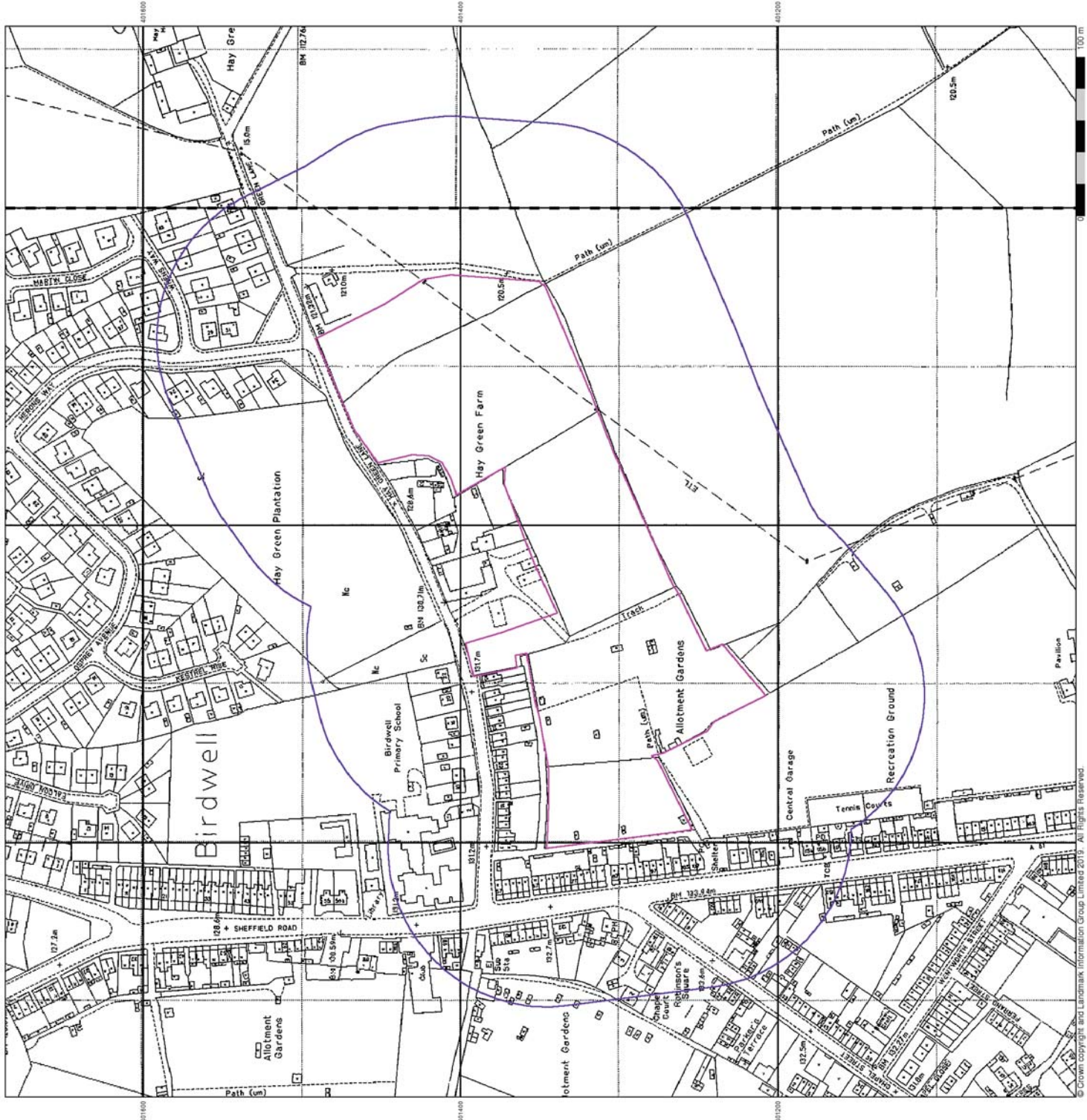
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Site Area (Ha): 4.01
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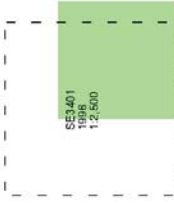
Large-Scale National Grid Data

Published 1996

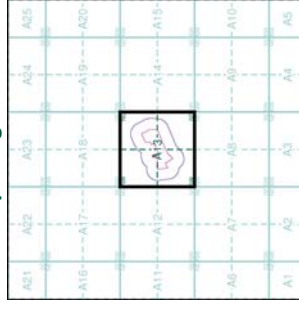
Source map scale - 1:2,500

Large Scale National Grid Data superseded SIM cards (Ordnance Survey's information on microfilm) in 1992, and continued to be produced until 1999. The maps are of digital origin and display at a scale that provides detailed information on buildings and roads, but lacks topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

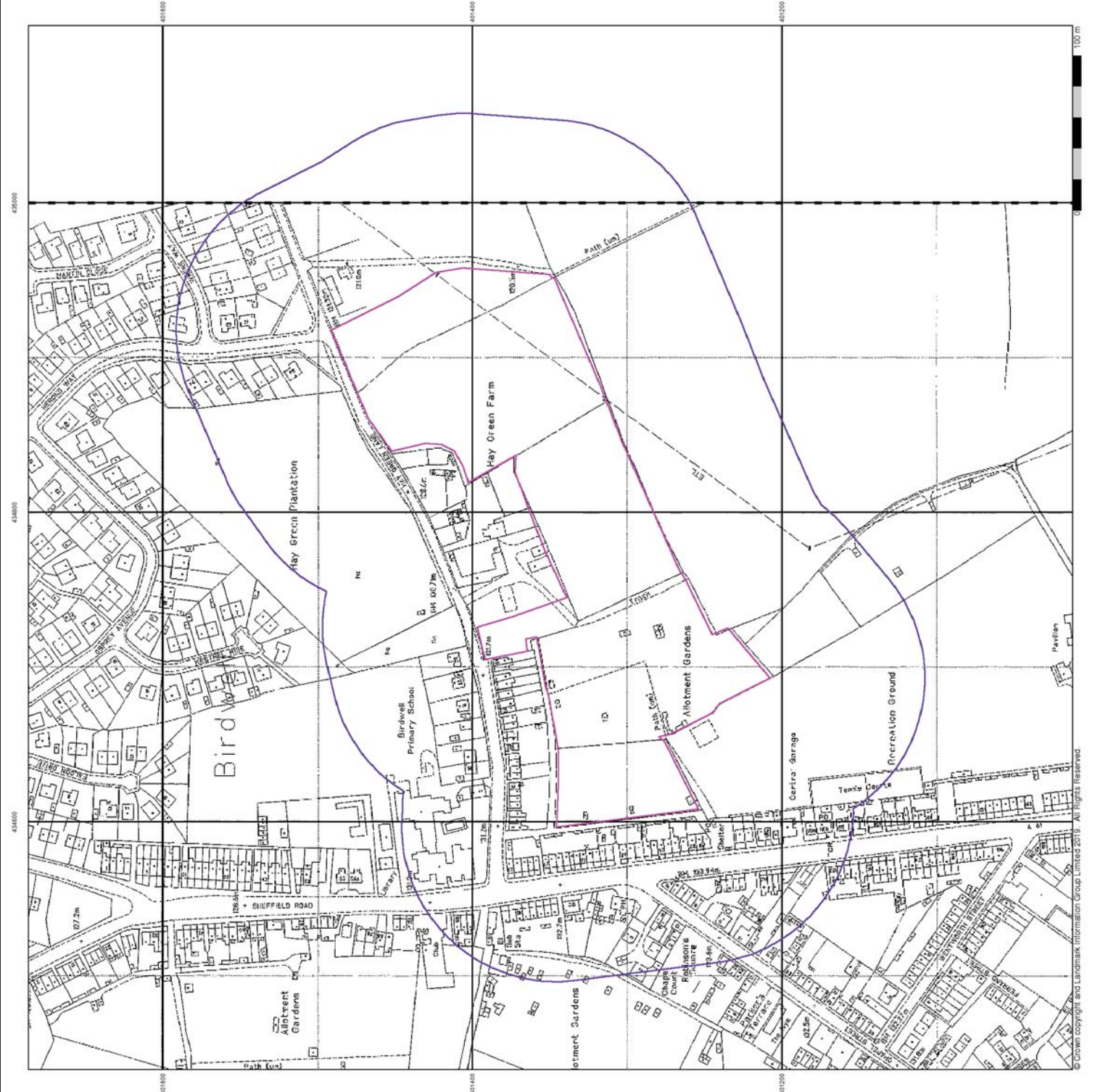
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National Grid Reference: 434780, 401350
Slice: A
Site Area (Ha): 4.01
Search Buffer (m): 100

Site Details

Hay Green Lane, Birdwell, BARNESLEY, S70 5XD



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



Historical Mapping Legends

Ordnance Survey County Series 1:10,560

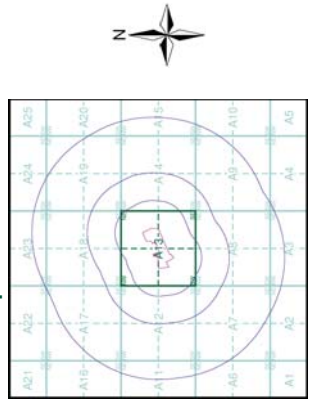
Ordnance Survey Plan 1:10,000

1:10,000 Raster Mapping

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Yorkshire	1:10,560	1855	2
Yorkshire	1:10,560	1893	3
Yorkshire	1:10,560	1907	4
Yorkshire	1:10,560	1932	5
Yorkshire	1:10,560	1938	6
Yorkshire	1:10,560	1948	7
Ordnance Survey Plan	1:10,000	1956	8
Ordnance Survey Plan	1:10,000	1965 - 1966	9
Ordnance Survey Plan	1:10,000	1978	10
Ordnance Survey Plan	1:10,000	1980 - 1982	11
Ordnance Survey Plan	1:10,000	1989	12
Ordnance Survey Plan	1:10,000	1991 - 1992	13
10K Raster Mapping	1:10,000	2000	14
Street View	Variable		15

Historical Map - Slice A



Order Details

Order Number: 224076250_1_1
 Customer Ref: 350283
 National Grid Reference: 434780, 401350
 Slice: A
 Site Area (Ha): 4.01
 Search Buffer (m): 1000

Site Details

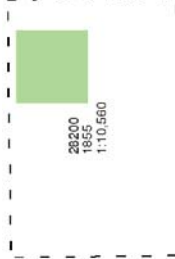
Hay Green Lane, Birdwell, BARNESLEY, S70 5XD



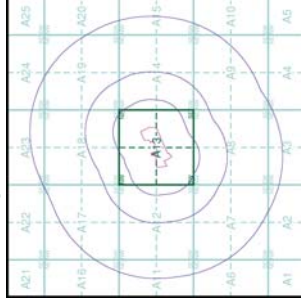
Tel: 0844 844 9952
 Fax: 0844 844 9951
 Web: www.envirocheck.co.uk

The historical maps shown were reproduced from maps predominantly held at the Ordnance Survey, which were adopted for England, Wales and Scotland in the 1840's. In 1854, the OS adopted the Cassini Projection, and the published maps are used to update the 1:10,560 maps. The published date refers to the date of the original survey, not the date the map was printed. The maps are based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to independent inaccuracies in cutting areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



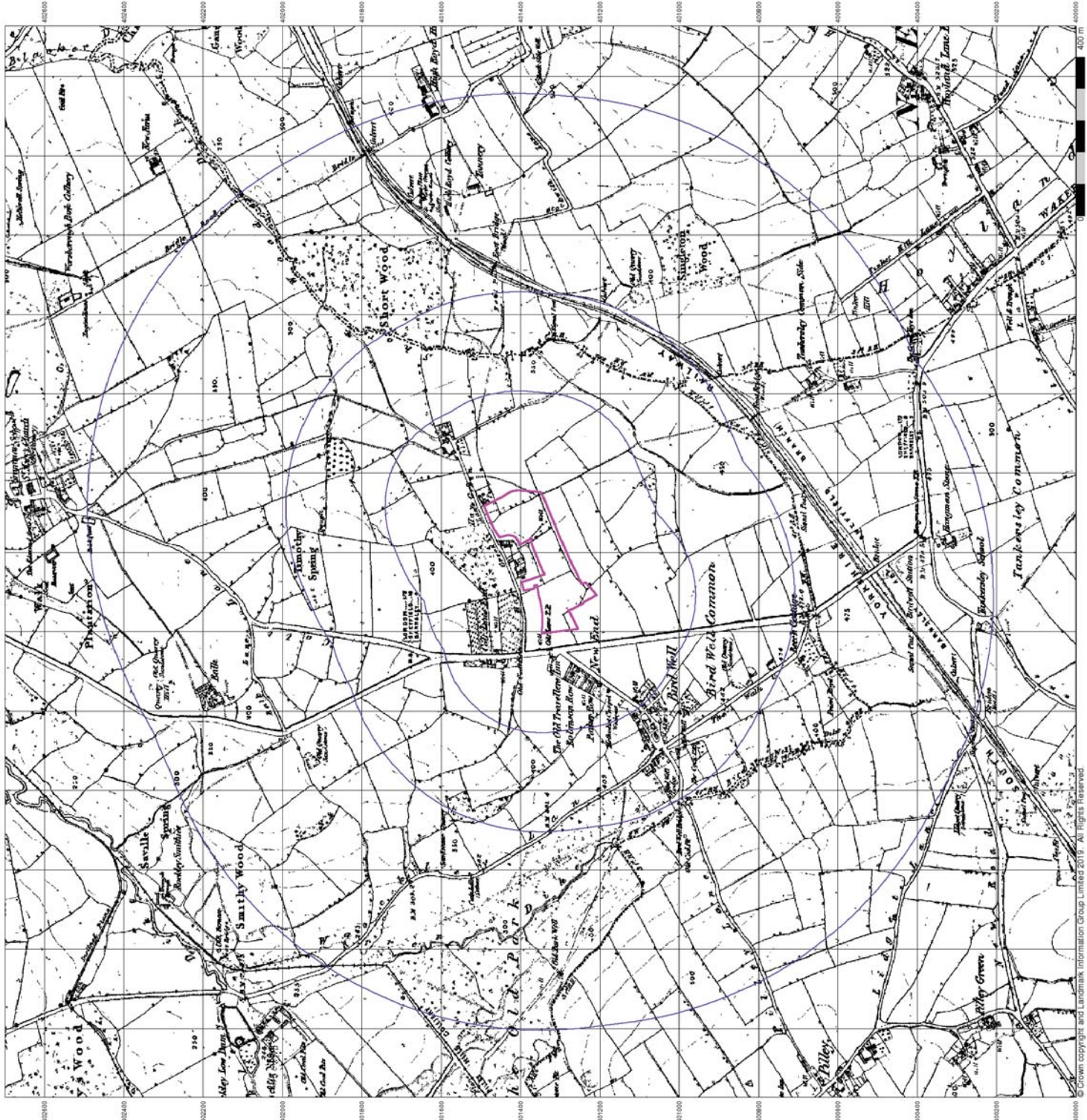
Order Details

Order Number: 224076250_1_1
 Customer Ref: 350283
 National Grid Reference: 434780, 401350

Slice: A
 Site Area (Ha): 4.01
 Search Buffer (m): 1000

Site Details

Hay Green Lane, Birdwell, BARNESLEY, S70 5XD





Yorkshire

Published 1893

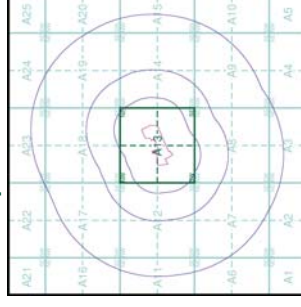
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the Ordnance Survey, and were scanned in the 1940's. In 1864, the Ordnance Survey adopted the Transverse Mercator Projection for its 1:2500 maps. The 1:10,560 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

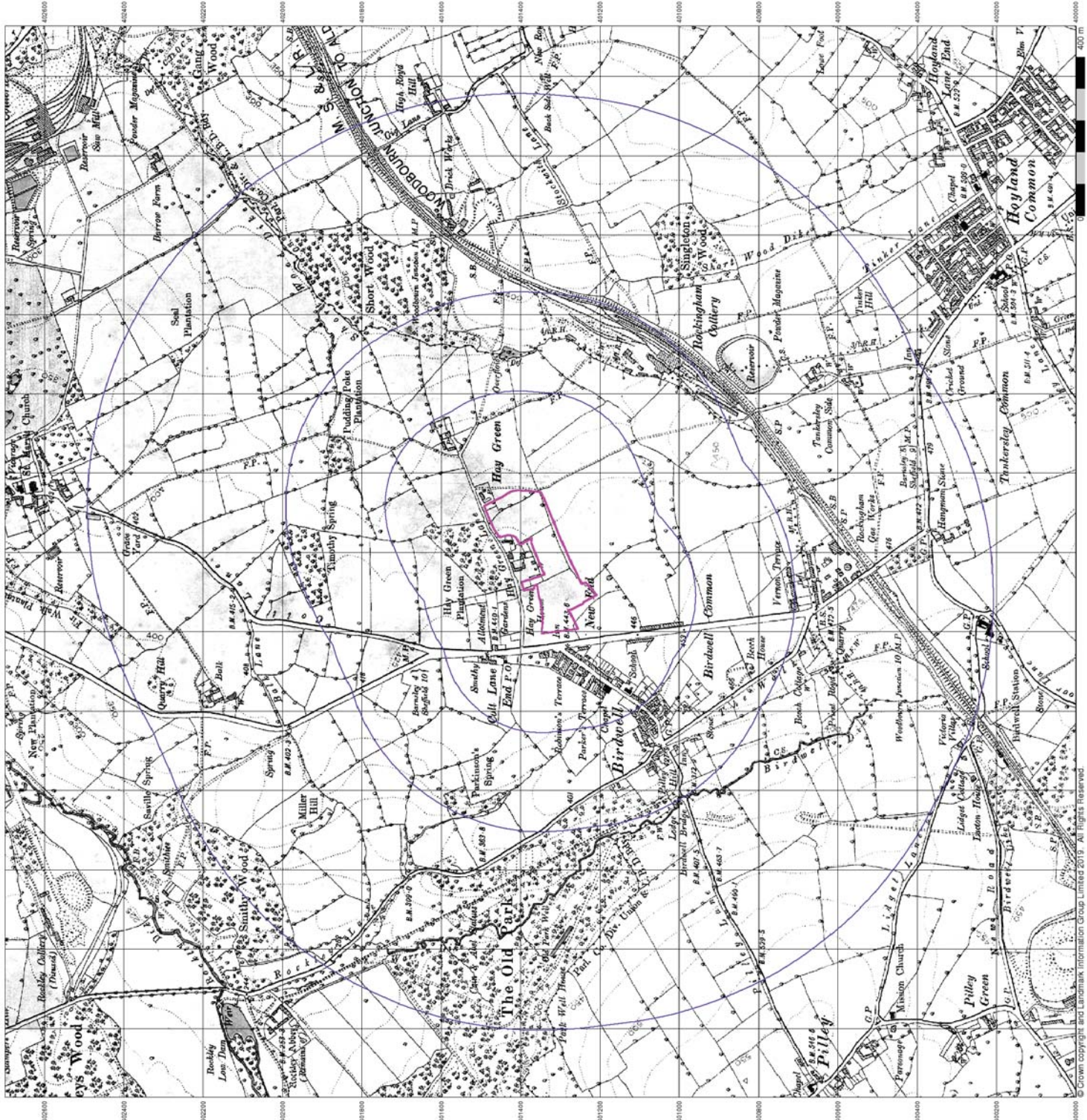
Order Number: 224076250_1_1
Customer Ref: 350283
National Grid Reference: 434780, 401350
Slice: A
Site Area (Ha): 4.01
Search Buffer (m): 1000

Site Details

Hay Green Lane, Birdwell, BARNESLEY, S70 5XD



Tel: 0844 844 9952
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Web: www.envisioco.uk





Yorkshire

Published 1907

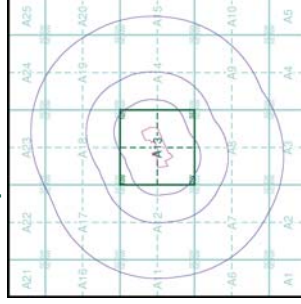
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the Ordnance Survey, and Scotland in the 1840's. In 1854, the Ordnance Survey adopted the Cassini map projection. The maps are used to update the 1:10,560 maps. The published date is the date of the original map, not the date of the reproduction. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in cutting areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

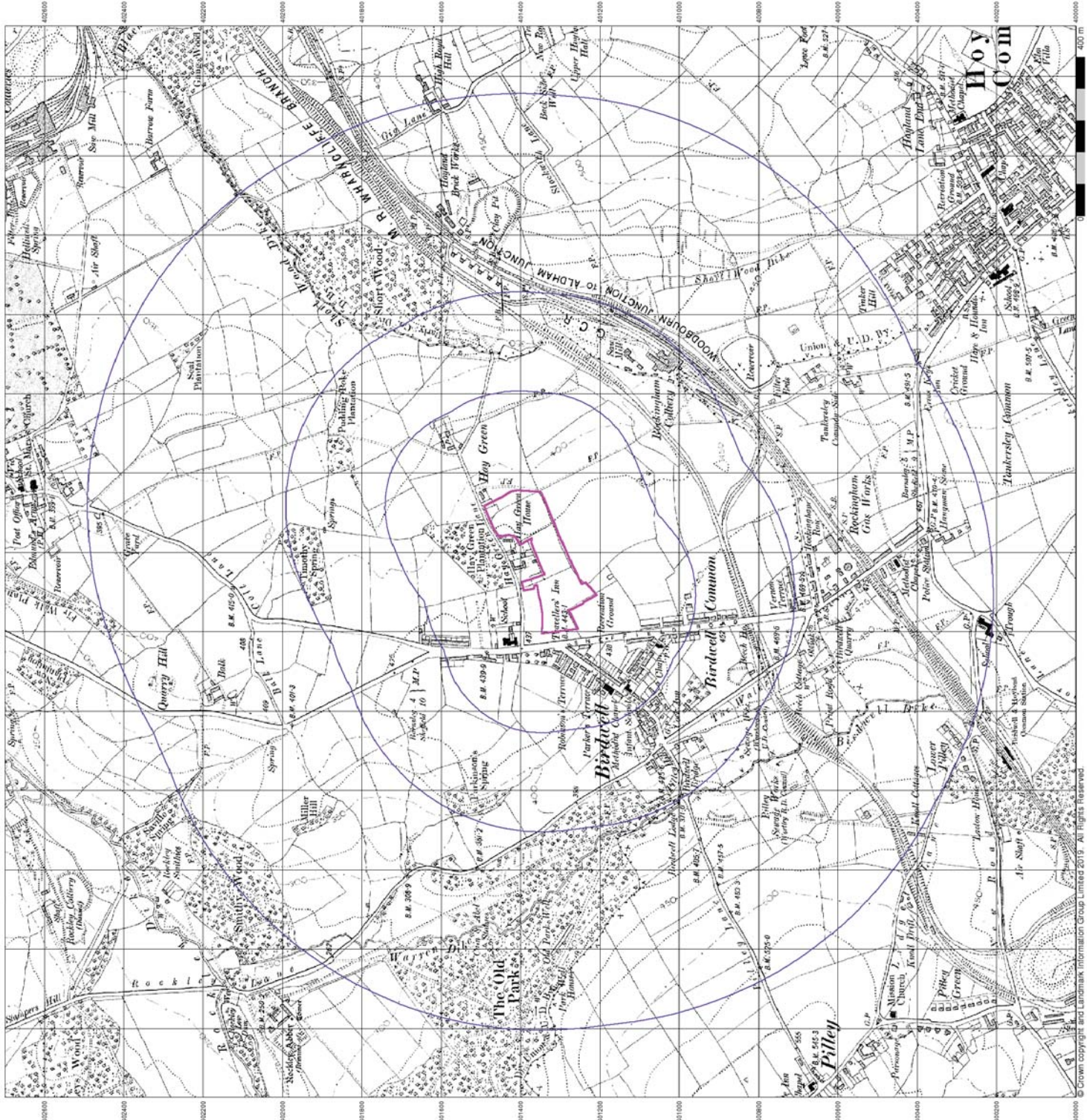
Order Number: 224076250_1_1
Customer Ref: 350283
National Grid Reference: 434780, 401350
Slice: A
Site Area (Ha): 4.01
Search Buffer (m): 1000

Site Details

Hay Green Lane, Birdwell, BARNESLEY, S70 5XD



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Fax: 0844 844 9951
Web: www.envisiotech.co.uk





Yorkshire

Published 1932

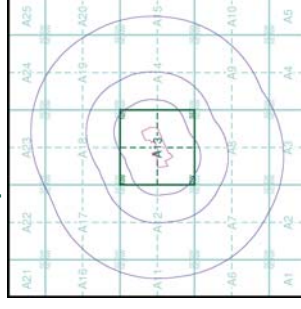
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at a scale adopted for England, Wales and Scotland in the 1840's. In 1864 a scale of 1:2500 was used for the first time. The published maps are used to update the 1:10,560 maps. The published date is then there are often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

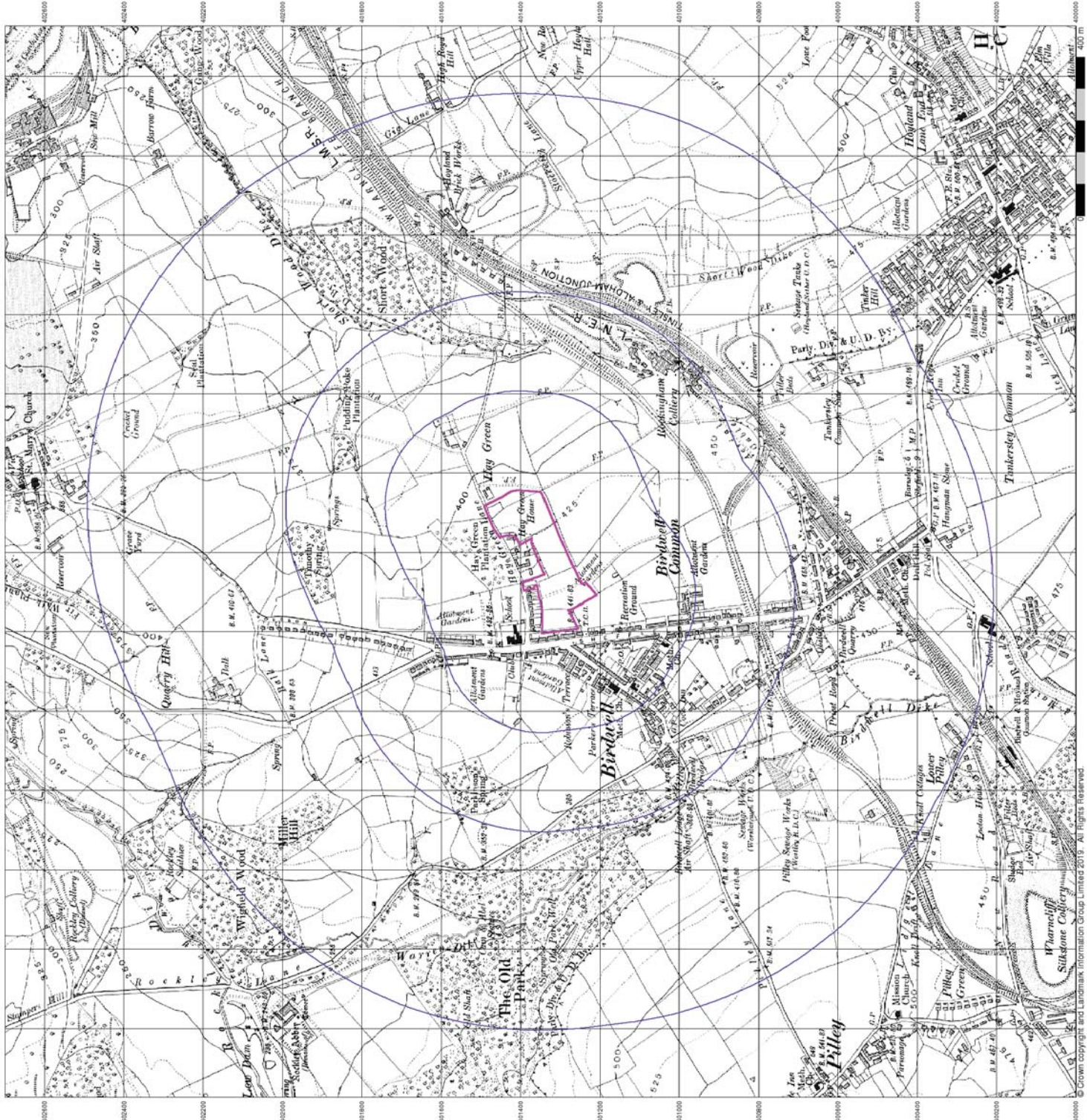
Order Number: 224076250_1_1
Customer Ref: 350283
National Grid Reference: 434780, 401350
Slice: A
Site Area (Ha): 4.01
Search Buffer (m): 1000

Site Details

Hay Green Lane, Birdwell, BARNESLEY, S70 5XD



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





Yorkshire

Published 1938

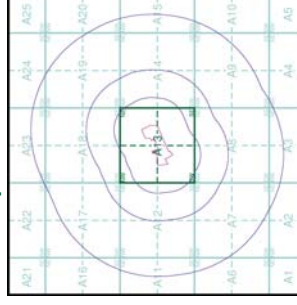
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the Ordnance Survey, and Scotland in the 1840's. In 1864, the Ordnance Survey adopted the Transverse Mercator Projection and used to update the 1:10,560 maps. The published date of the maps are often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys in cutting county or group of counties, giving rise to significant inaccuracies in cutting areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

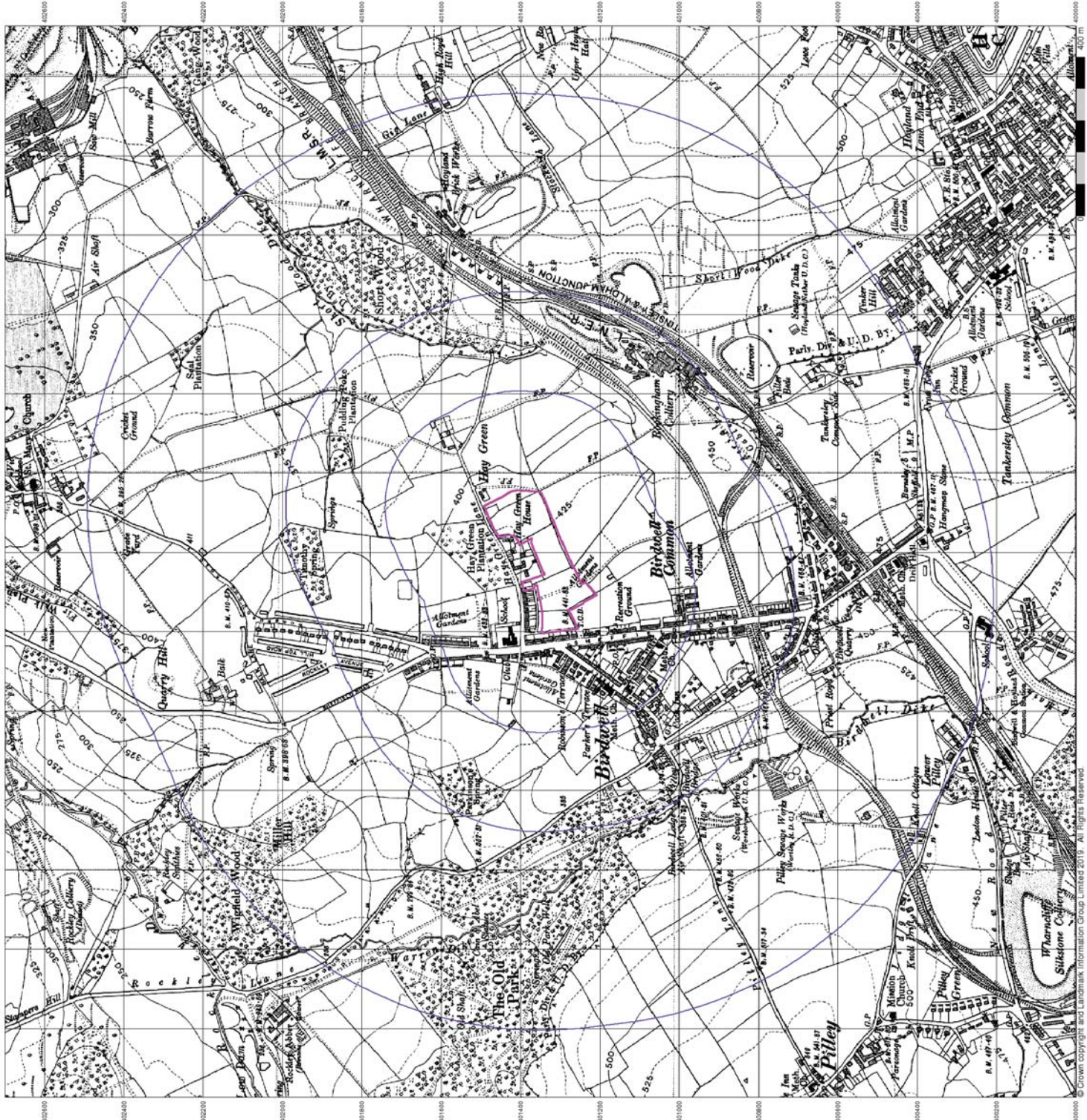
Order Number: 224076250_1_1
Customer Ref: 350283
National Grid Reference: 434780, 401350
Slice: A
Site Area (Ha): 4.01
Search Buffer (m): 1000

Site Details

Hay Green Lane, Birdwell, BARNSELEY, S70 5XD



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Yorkshire

Published 1948

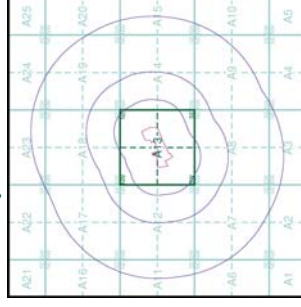
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the Ordnance Survey, and Scotland in the 1840's. In 1864...

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

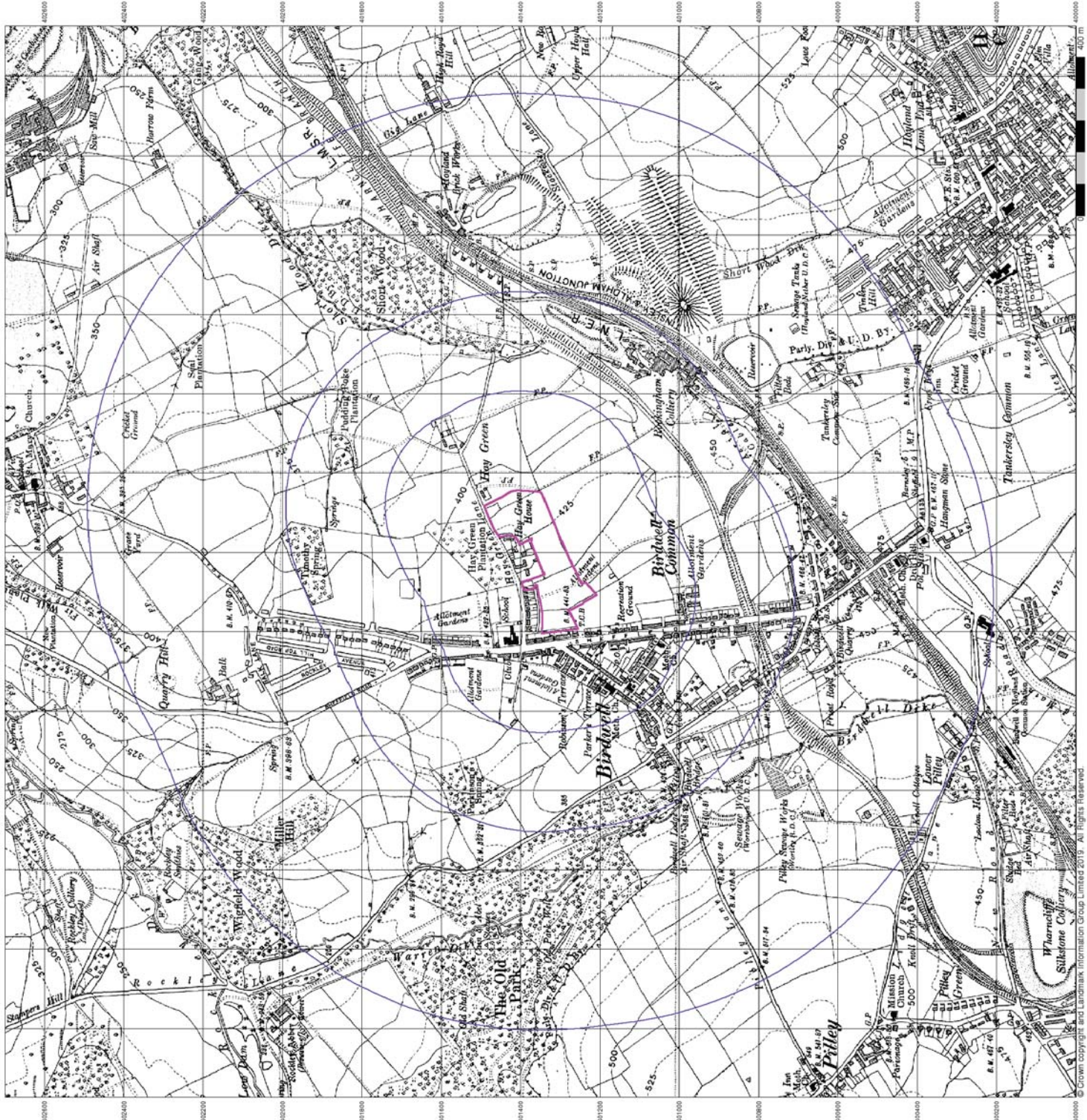
Order Number: 224076250_1_1
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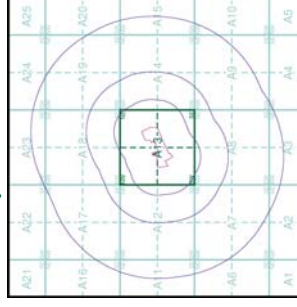
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at a scale of 1:10,000 adopted for England, Wales and Scotland in the 1840's. In 1864 a scale of 1:25,000 was adopted for the Ordnance Survey maps. The maps are used to update the 1:10,000 maps. The published date is the date the maps were first published, not the date the survey was conducted. The maps are often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties giving rise to significant inaccuracies in cutting areas. In the late 1940's a Provisional Edition was produced, which updated the 1:10,000 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

SE30SW	1956	SE30SE	1956
1:10,000	1:10,000	1:10,000	1:10,000
SK39NW	1956	SK39NE	1956
1:10,000	1:10,000	1:10,000	1:10,000

Historical Map - Slice A

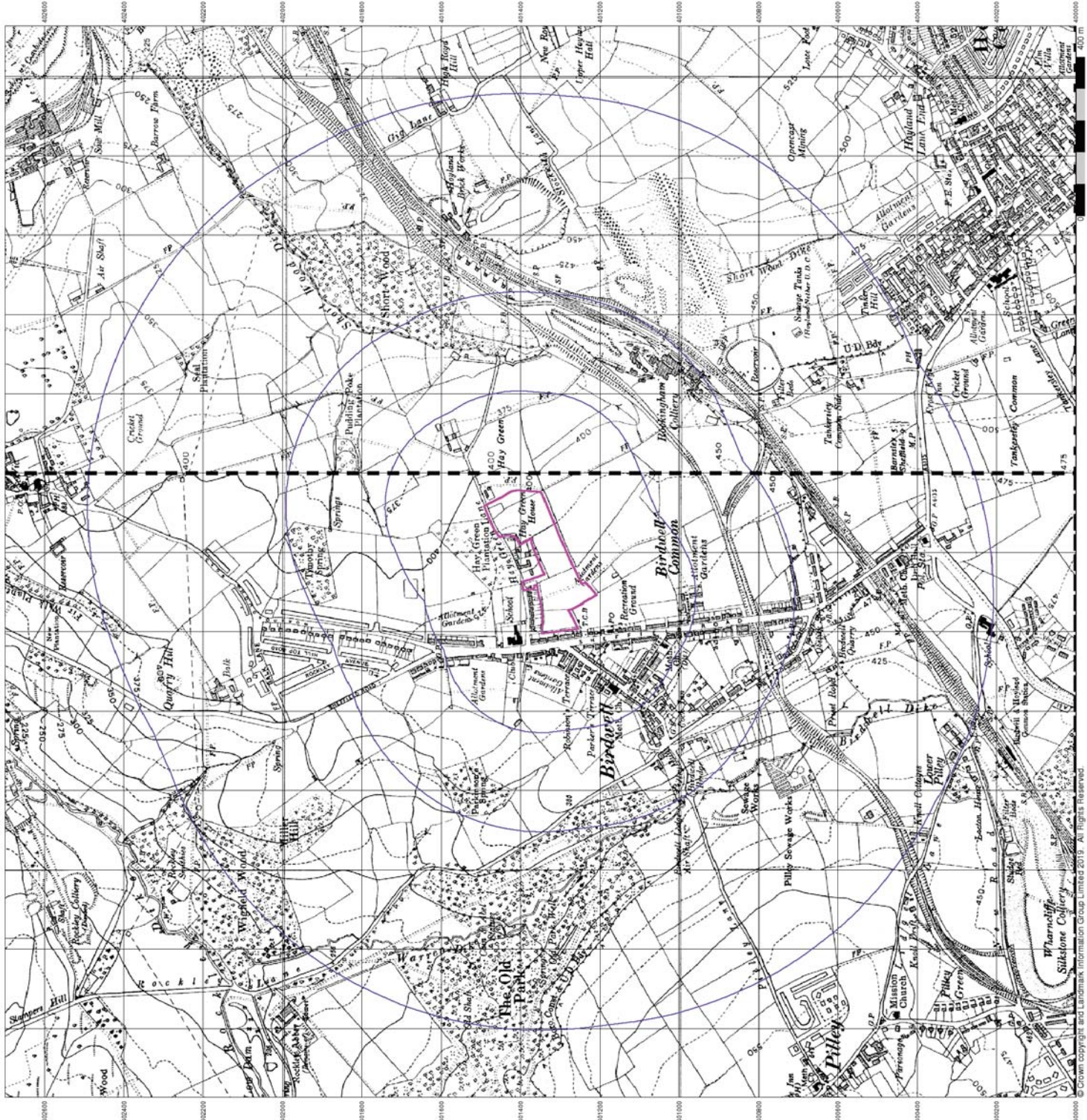


Order Details

Order Number: 224076250_1_1
 Customer Ref: 350283
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 Slice: A
 Site Area (Ha): 4.01
 Search Buffer (m): 1000

Site Details

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Ordinance Survey Plan Published 1965 - 1966

Source map scale - 1:10,000

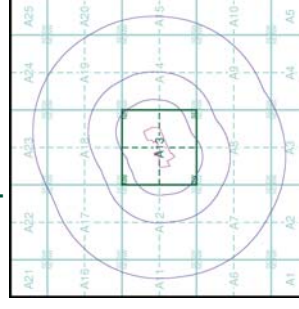
The historical maps shown were reproduced from maps predominantly held at a 1:25,000 scale for England, Wales and Scotland in the 1940's. In 1964, the OS adopted the 1:10,000 scale for its urban maps. The maps are used to update the 1:10,000 maps. The published date is then the date of the survey, rather than the date of publication. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,000 mapping from a number of sources. The maps appear 'unfinished', with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

SE30SW	SE30SE
1965	1966
1:10,000	1:10,000

SK39NW	SK39NE
1965	1965
1:10,000	1:10,000

Historical Map - Slice A



Order Details

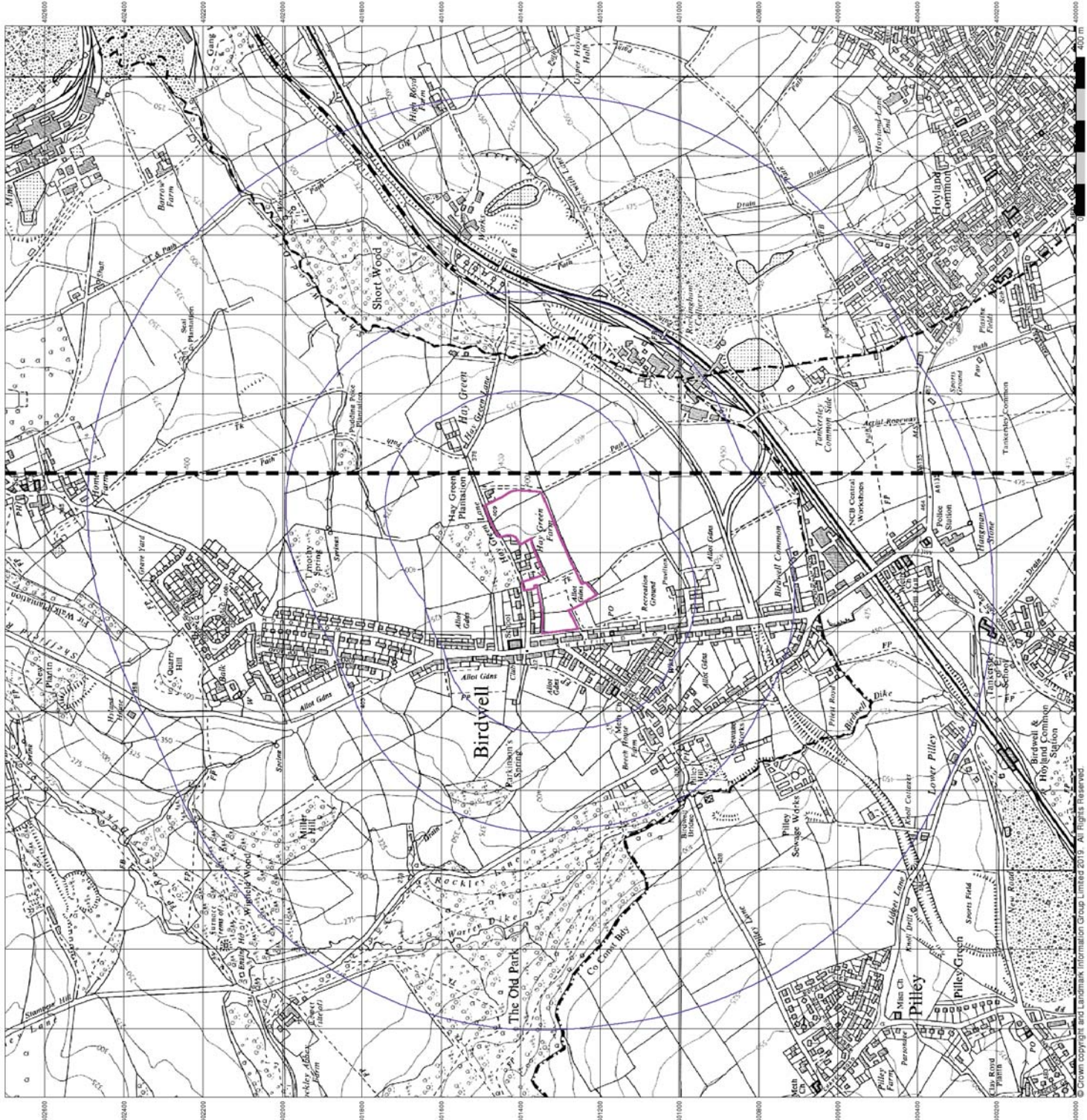
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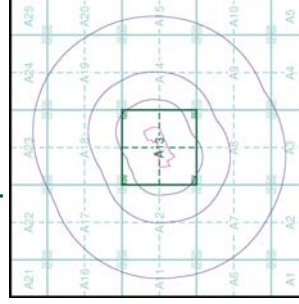
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at a 1:25,000 scale for England, Wales and Scotland in the 1940's. In 1954, the Ordnance Survey published a series of 1:10,000 maps which were used to update the 1:25,000 maps. The published date on these maps are often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,000 mapping on a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A

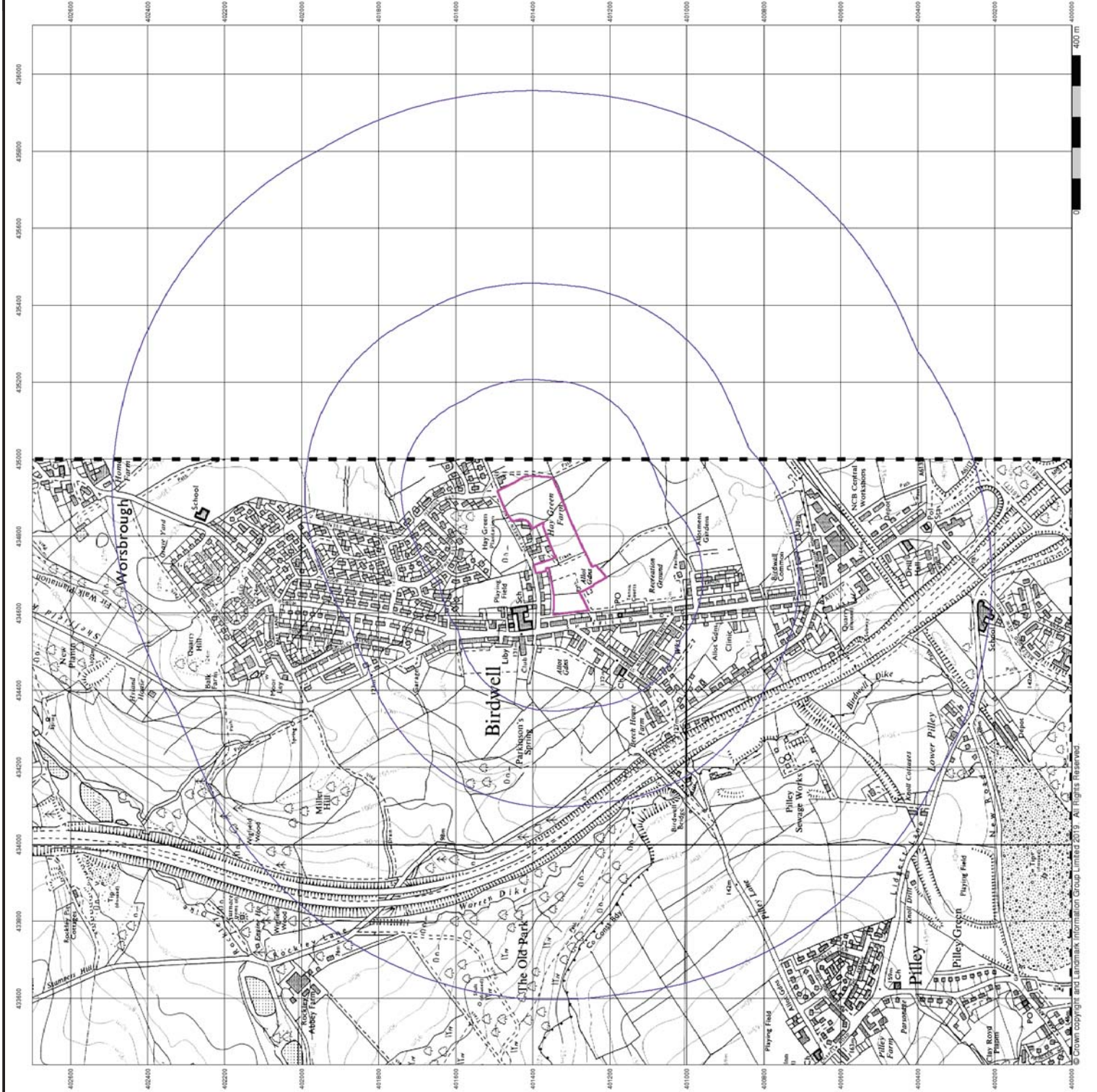


Order Details

Order Number: 224076250_1_1
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 Site Area (Ha): 4.01
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Site Details

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Source map scale - 1:10,000

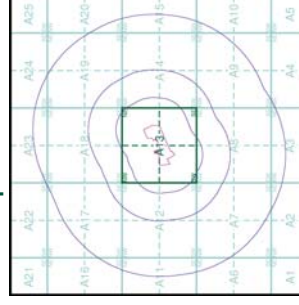
The historical maps shown were produced from the Ordnance Survey's 1:10,000 colour raster mapping. These maps are published from their data which was collected in 1970. The raster mapping is highly detailed showing buildings, roads and field boundaries as well as all roads, tracks and paths. Road names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

Map Name(s) and Date(s)

SE30SW	SE30SE
2000	2000
1:10,000	1:10,000

SK39NW	SK39NE
2000	2000
1:10,000	1:10,000

Historical Map - Slice A

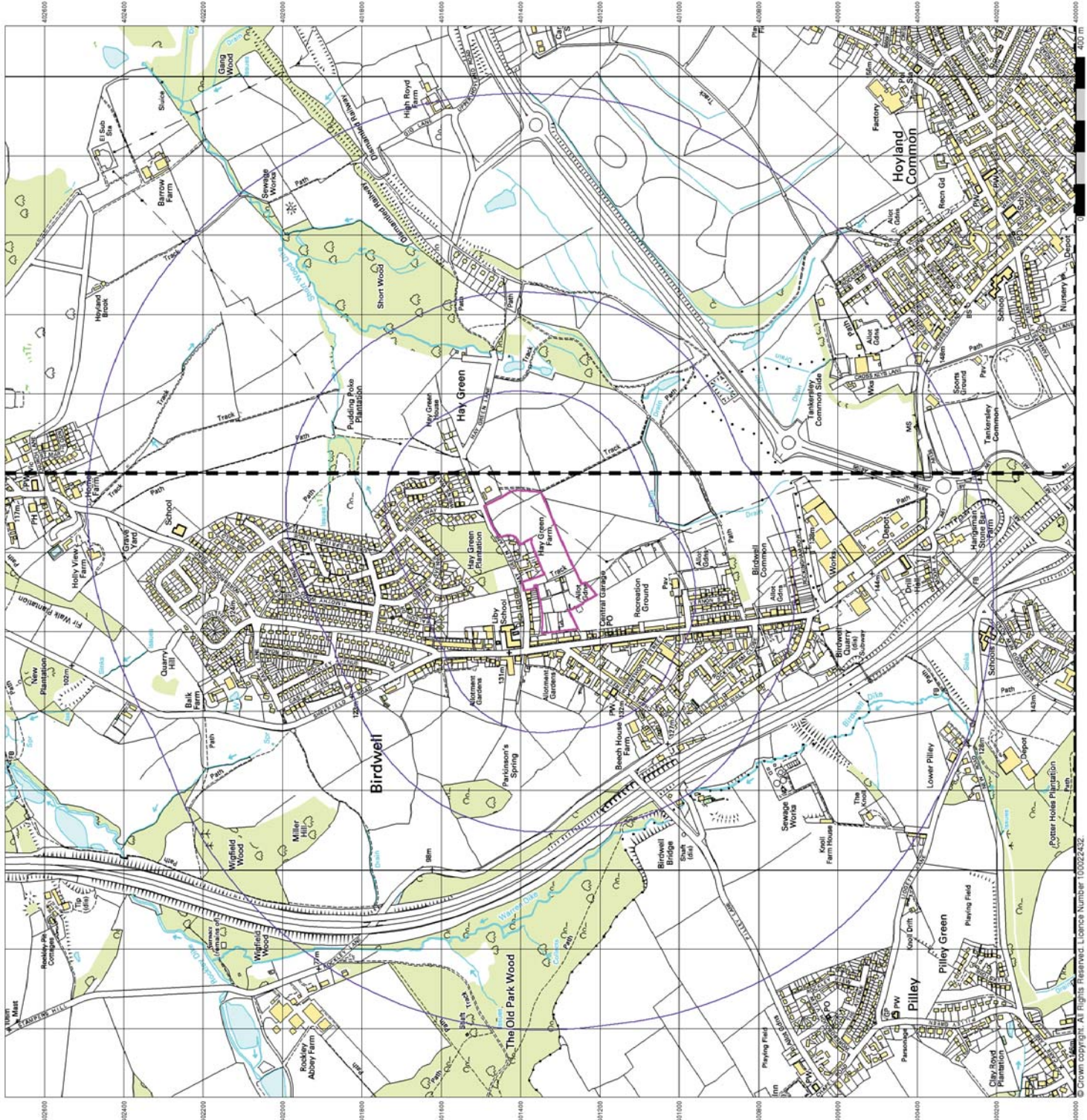


Order Details

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Street View

Published 2019

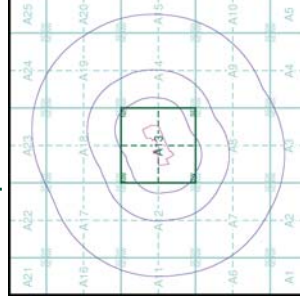
Source map scale - 1:10,000

Street View is a street-level map for the whole of Great Britain produced by the Ordnance Survey. These maps are provided at a nominal scale of 1:10,000

Map Name(s) and Date(s)



Street View Map - Slice A



Order Details

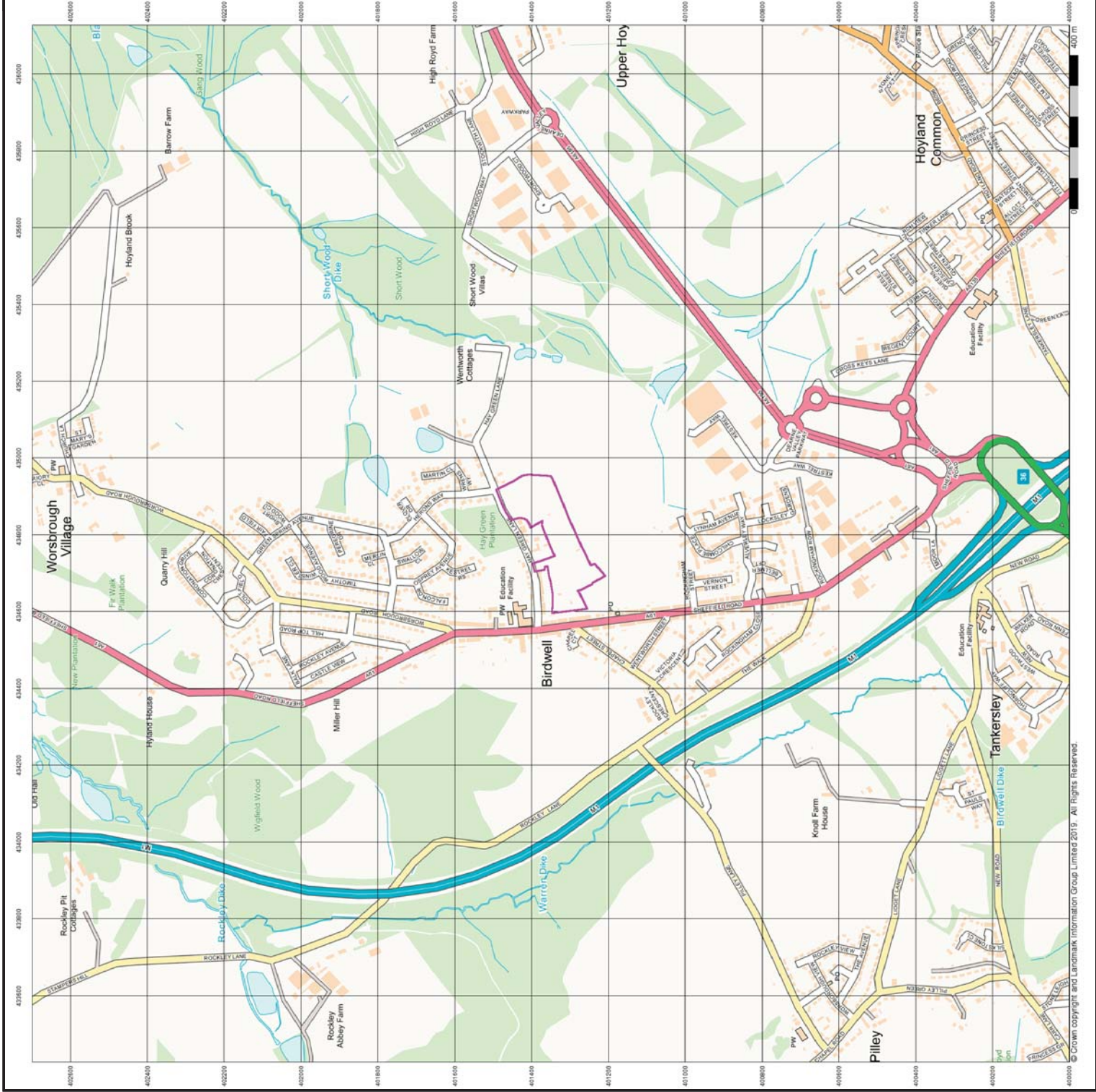
Order Number: 224076250_1_1
Customer Ref: 350283
National Grid Reference: 434780, 401350
Slice: A
Site Area (Ha): 4.01
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Groundwater Vulnerability

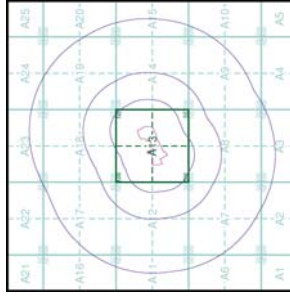
- General**
- Specified Site
 - Specified Buffer(s)
 - Bearing Reference Point
 - Site
 - Map ID

Agency and Hydrological

- Bedrock Aquifers**
- High Vulnerability, Principal Aquifer
 - High Vulnerability, Secondary Aquifer
 - Medium Vulnerability, Principal Aquifer
 - Medium Vulnerability, Secondary Aquifer
 - Low Vulnerability, Principal Aquifer
 - Low Vulnerability, Secondary Aquifer
- Superficial Aquifers**
- High Vulnerability, Principal Aquifer
 - High Vulnerability, Secondary Aquifer
 - Medium Vulnerability, Principal Aquifer
 - Medium Vulnerability, Secondary Aquifer
 - Low Vulnerability, Principal Aquifer
 - Low Vulnerability, Secondary Aquifer

- Unproductive Aquifer
- Soluble Rock

Site Sensitivity Context Map - Slice A



Order Details

Order Number: 224076250_1_1
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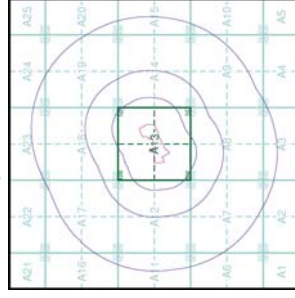
Bedrock Aquifer Designation

- General**
- Specified Site
 - Specified Buffer(s)
 - Bearing Reference Point
 - Site
 - Map ID

Agency and Hydrological

- Geological Classes**
- Principal Aquifer
 - Secondary A Aquifer
 - Secondary B Aquifer
 - Secondary Undifferentiated
 - Unproductive Strata
 - Unknown
 - Unknown (Lakes and Landlip)

Site Sensitivity Context Map - Slice A

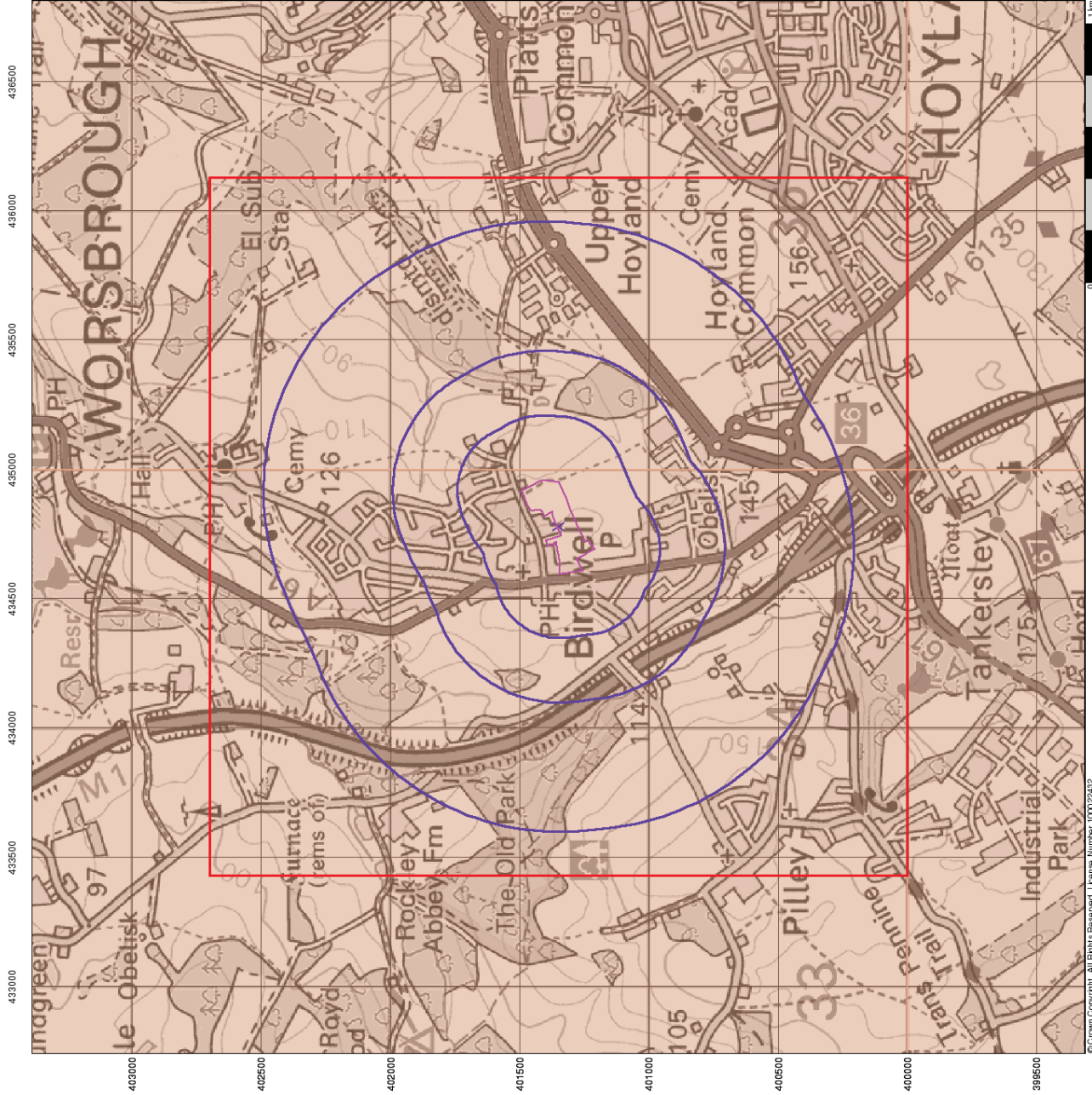


Order Details

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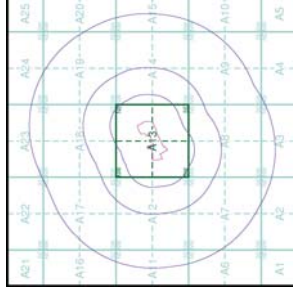
Superficial Aquifer Designation

- General**
- Specified Site
 - Specified Buffer(s)
 - Bearing Reference Point
 - Site
 - Map ID

Agency and Hydrological

- Geological Classes**
- Principal Aquifer
 - Secondary A Aquifer
 - Secondary B Aquifer
 - Secondary Undifferentiated
 - Unproductive Strata
 - Unknown
 - Unknown (Lakes and Landlip)

Site Sensitivity Context Map - Slice A



Order Details

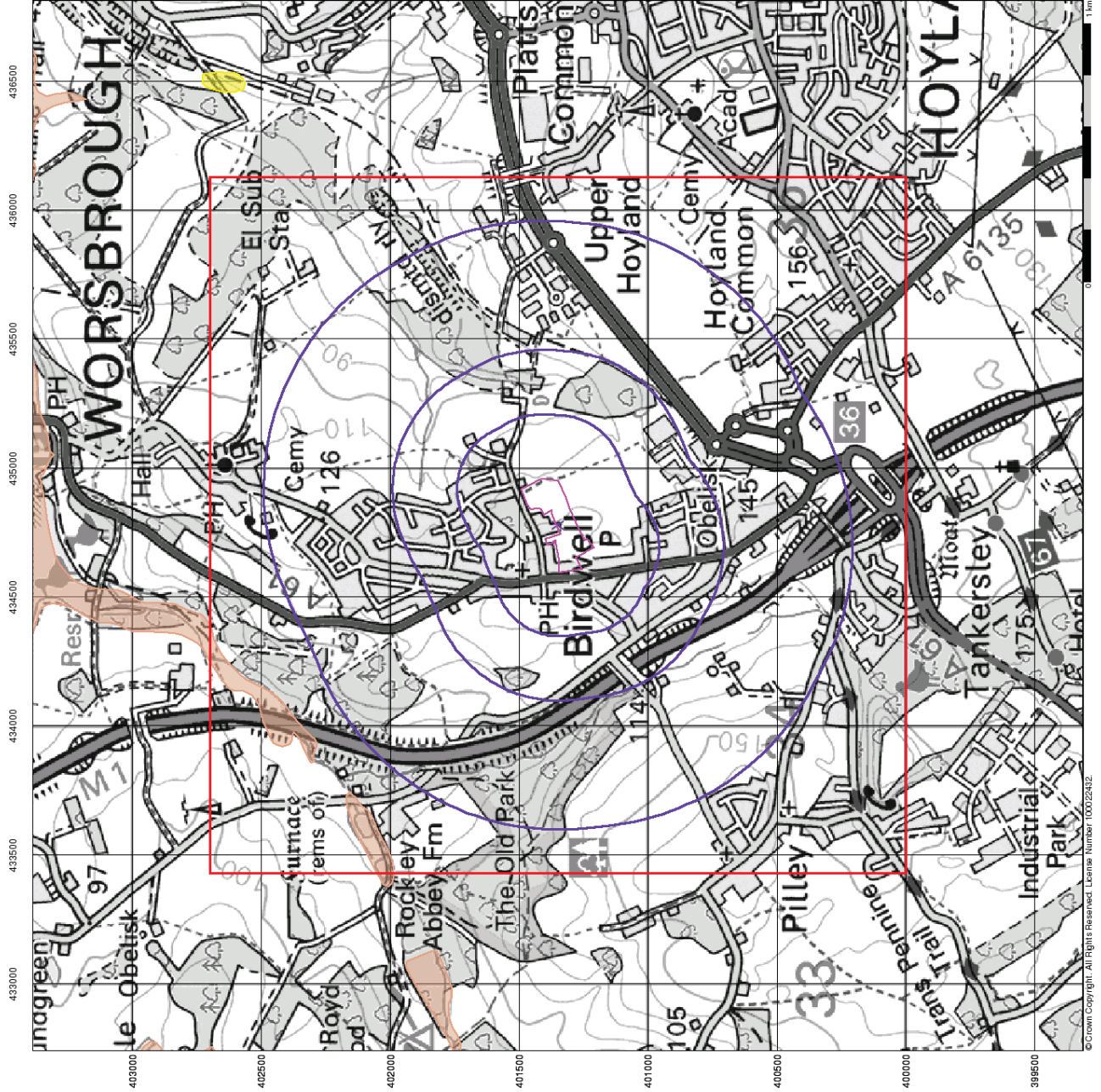
Order Number: 224076250_1_1
 Customer Ref: 350283
 National Grid Reference: 434780, 401350
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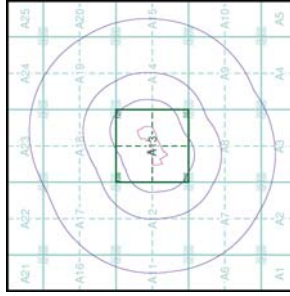
Source Protection Zones

- General**
- Specified Site
 - Specified Buffer(s)
 - Bearing Reference Point
 - Site
 - Map ID

Agency and Hydrological

- Inner zone (Zone 1)
- Inner zone - subsurface activity only (Zone 1c)
- Outer zone (Zone 2)
- Outer zone - subsurface activity only (Zone 2c)
- Total catchment (Zone 3)
- Total catchment - subsurface activity only (Zone 3c)
- Special Interest (Zone 4)

Site Sensitivity Context Map - Slice A



Order Details

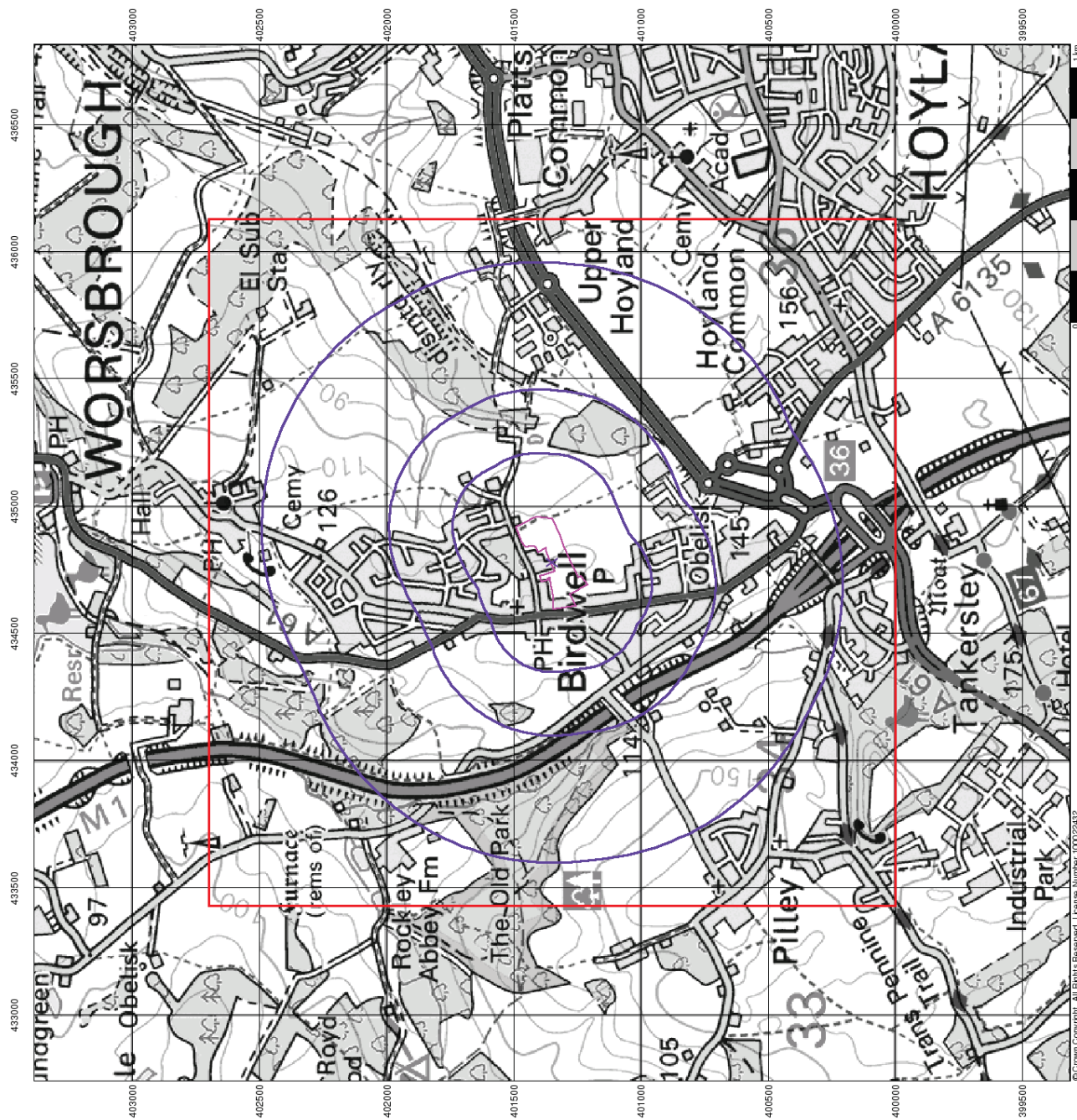
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 National Grid Reference: 434780, 401350
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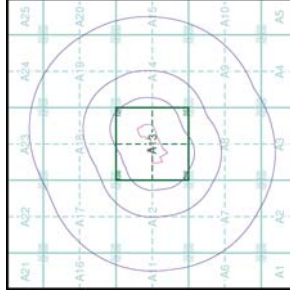
Sensitive Land Uses

- General**
- Specified Site
 - Specified Buffer(s)
 - Bearing Reference Point
 - Site
 - Map ID

Sensitive Land Uses

- Ancient Woodland
- Area of Adopted Green Belt
- Area of Unadopted Green Belt
- Area of Outstanding Natural Beauty
- Environmentally Sensitive Area
- Forest Park
- Local Nature Reserve
- Marine Nature Reserve
- National Nature Reserve
- National Park
- Nitrate Sensitive Area
- Nitrate Vulnerable Zone
- Ramsar Site
- Site of Special Scientific Interest
- Special Area of Conservation
- Special Protection Area
- World Heritage Sites

Site Sensitivity Context Map - Slice A



Order Details

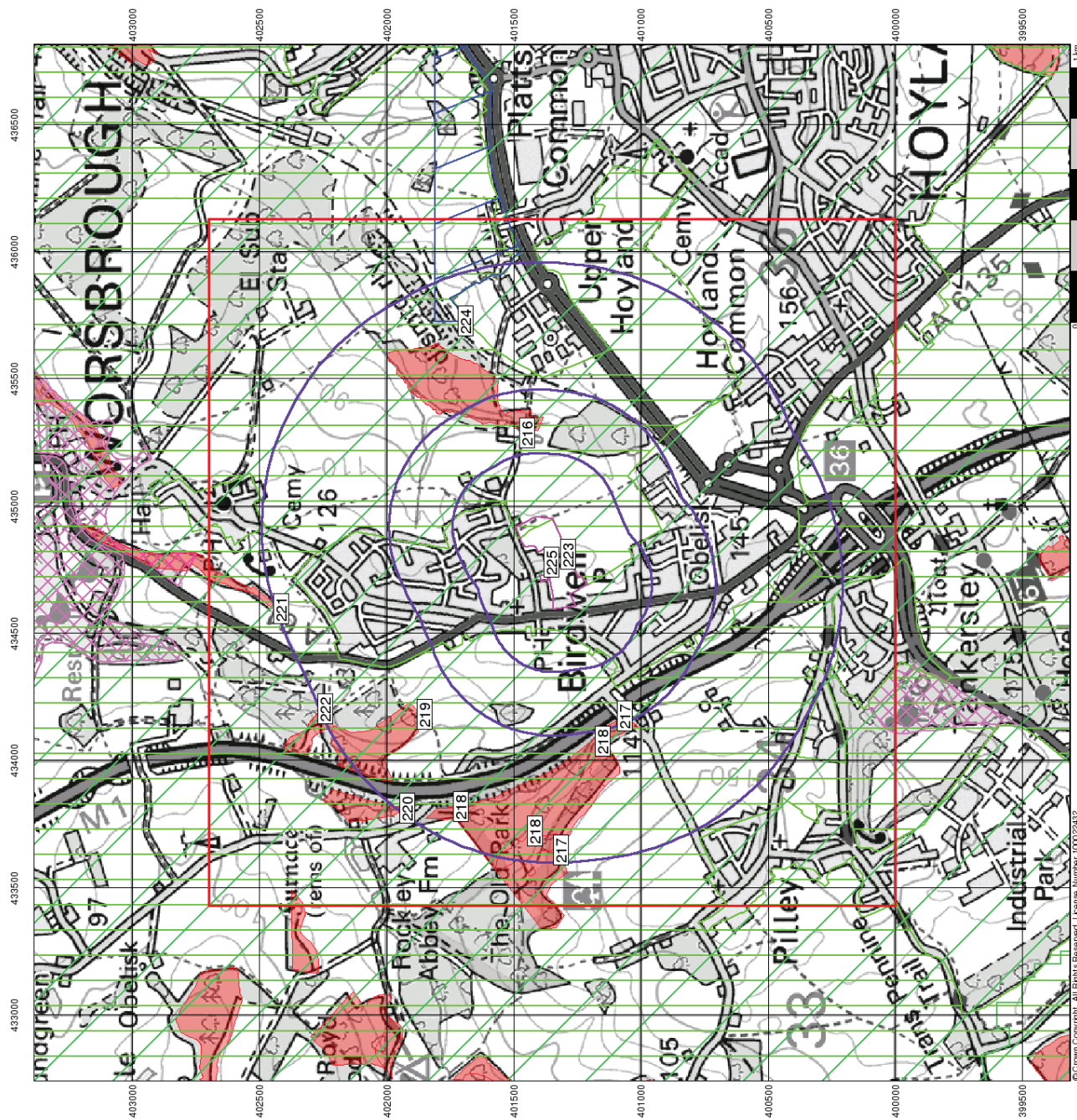
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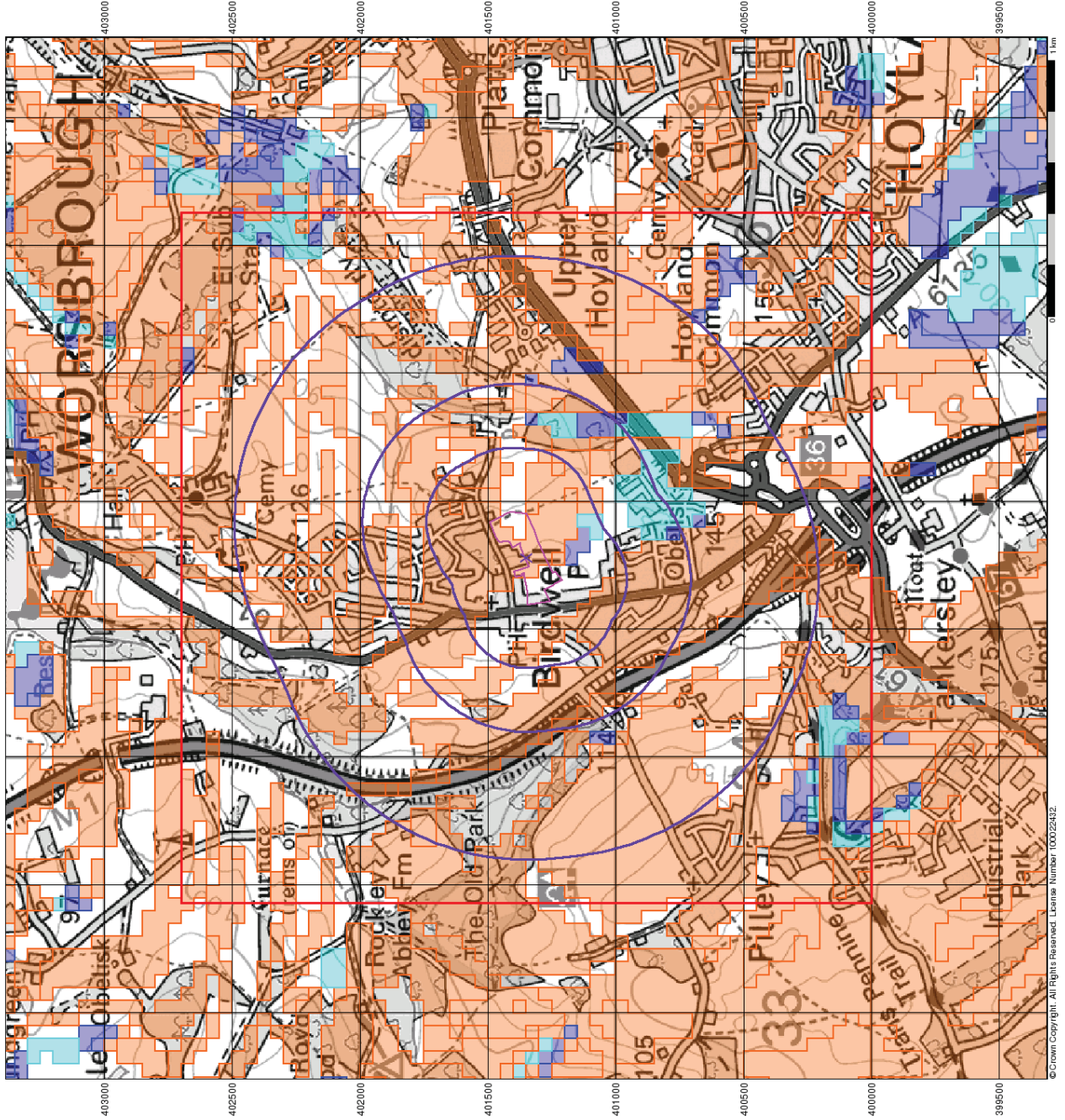
BGS Flood GFS Data

General

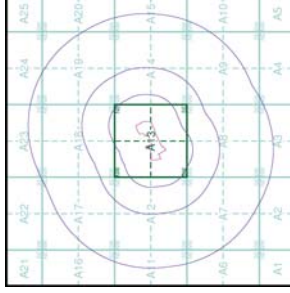
- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice

Agency and Hydrological (Flood)

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface



Site Sensitivity Context Map - Slice A



Order Details

Order Number: 224076250_1_1
 Customer Ref: 350283
 National Grid Reference: 434780, 401350
 Slice: A
 Site Area (Ha): 4.01
 Search Buffer (m): 1000

Site Details

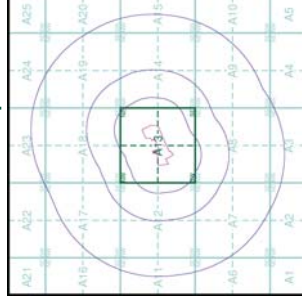
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- General**
- Specified Site
 - Specified Buffer(s)
 - Bearing Reference Point
 - Site
 - Map ID
- Industrial Land Use**
- Contemporary Trade Directory Entry
 - Fuel Station Entry
 - Gas Pipeline
 - Underground Electrical Cables

Industrial Land Use Map - Slice A



Order Details

Order Number: 224076250_1_1
 Customer Ref: 350283
 National Grid Reference: 434780, 401350
 Site: A
 Site Area (Ha): 4.01
 Search Buffer (m): 1000

Site Details

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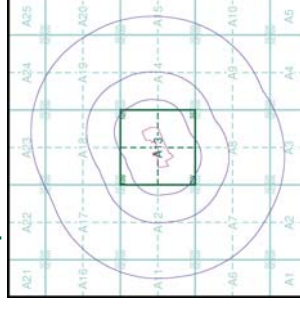
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

Agency and Hydrological (Flood)

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

Flood Map - Slice A



Order Details

Order Number: 224076250_1_1
 Customer Ref: 350283
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 Slice: A
 Site Area (Ha): 4.01
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Site Details

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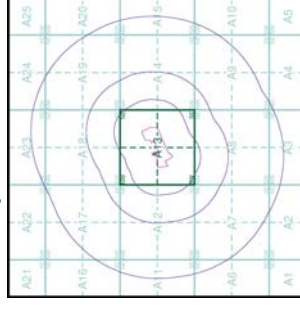
- General**
- Specified Site
 - Specified Buffer(s)
 - X Bearing Reference Point
 - Map ID
 - Several of Type at Location

Agency and Hydrological (Boreholes)

- BGS Borehole Depth 0 - 10m
- BGS Borehole Depth 10 - 30m
- BGS Borehole Depth 30m +
- Confidential
- Other

For borehole information please refer to the Borehole .csv file which accompanied this slice.
 A copy of the BGS Borehole Ordering Form is available to download from the Support section of www.envirocheck.co.uk.

Borehole Map - Slice A



Order Details

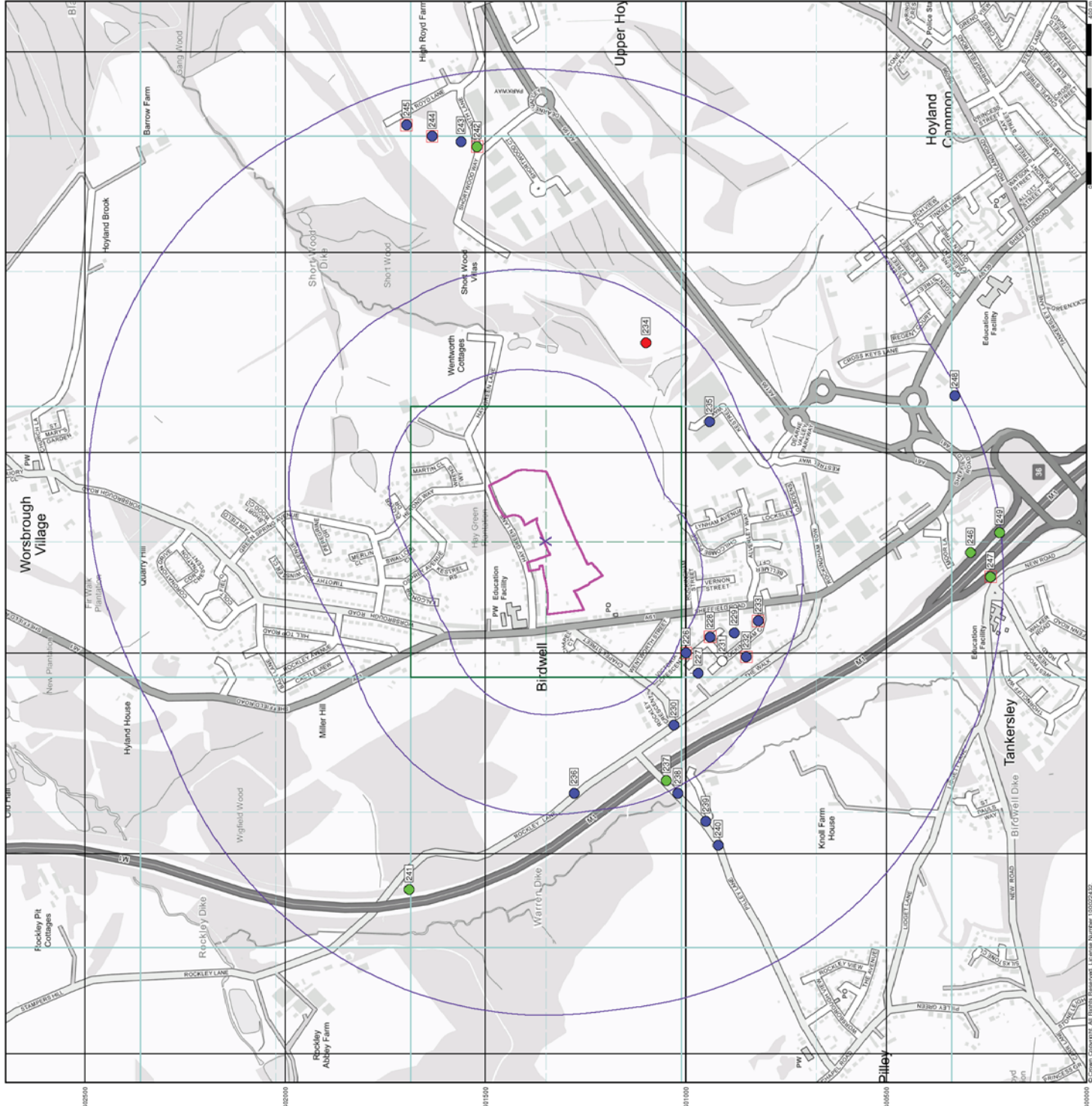
Order Number: 224076250_1_1
 Customer Ref: 350283
 National Grid Reference: 434780, 401350
 Slice: A
 Site Area (Ha): 4.01
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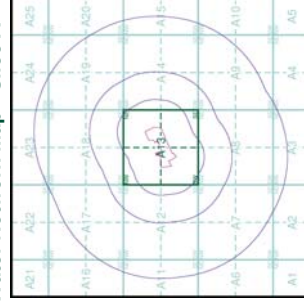
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

OS Water Network Data

- Canal
- Reservoir
- Foreshore
- Marsh
- Tidal River
- Inland River
- Drain
- Other
- Lake
- Transfer
- Lock Or Flight Of Locks
- Sea

OS Water Network Map - Slice A



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Envirocheck[®] Report:

Datasheet

Order Details:

Order Number:

224076250_1_1

Customer Reference:

350283

National Grid Reference:

434780, 401350

Slice:

A

Site Area (Ha):

4.01

Search Buffer (m):

1000

Site Details:

Hay Green Lane

Birdwell

BARNSLEY

S70 5XD

Client Details:

Miss L Alderman

RSK Environment Ltd

RSK Geoconsult Limited

The Potteries

Pottery Street

Casleford

West Yorkshire

WF10 1NJ

Report Section	Page Number
Summary	-
Agency & Hydrological	1
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Industrial Land Use	46
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Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination. For this reason, Landmark's Site Sensitivity maps and Datasheet(s) place great emphasis on statutory data provided by the Environment Agency/Natural Resources Wales and the Scottish Environment Protection Agency; it also incorporates data from Natural England (and the Scottish and Welsh equivalents) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the Landmark database to a distance defined by the client from a site boundary provided by the client. In this datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

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Report Version v53.0

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
BGS Groundwater Flooding Susceptibility	pg 1	Yes	Yes	Yes	n/a
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 3		7	9	24
Prosecutions Relating to Controlled Waters			n/a	n/a	n/a
Enforcement and Prohibition Notices					
Integrated Pollution Controls					
Integrated Pollution Prevention And Control					
Local Authority Integrated Pollution Prevention And Control					
Local Authority Pollution Prevention and Controls	pg 13			2	3
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 13		Yes		
Pollution Incidents to Controlled Waters	pg 13			2	8
Prosecutions Relating to Authorised Processes					
Registered Radioactive Substances					
River Quality	pg 15		1	1	
River Quality Biology Sampling Points					
River Quality Chemistry Sampling Points					
Substantiated Pollution Incident Register	pg 15				1
Water Abstractions	pg 16				(*18)
Water Industry Act Referrals					
Groundwater Vulnerability Map	pg 20	Yes	n/a	n/a	n/a
Groundwater Vulnerability - Soluble Rock Risk			n/a	n/a	n/a
Bedrock Aquifer Designations	pg 20	Yes	n/a	n/a	n/a
Superficial Aquifer Designations			n/a	n/a	n/a
Source Protection Zones					
Extreme Flooding from Rivers or Sea without Defences				n/a	n/a
Flooding from Rivers or Sea without Defences				n/a	n/a
Areas Benefiting from Flood Defences				n/a	n/a
Flood Water Storage Areas				n/a	n/a
Flood Defences				n/a	n/a
OS Water Network Lines	pg 21		3	30	72

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste					
BGS Recorded Landfill Sites					
Historical Landfill Sites	pg 33				3
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)					
Licensed Waste Management Facilities (Locations)	pg 33				2
Local Authority Landfill Coverage	pg 34	1	n/a	n/a	n/a
Local Authority Recorded Landfill Sites	pg 34				4
Registered Landfill Sites	pg 35				2
Registered Waste Transfer Sites	pg 35				1
Registered Waste Treatment or Disposal Sites	pg 36				1
Hazardous Substances					
Control of Major Accident Hazards Sites (COMAH)					
Explosive Sites					
Notification of Installations Handling Hazardous Substances (NIHHS)	pg 37				1
Planning Hazardous Substance Consents					
Planning Hazardous Substance Enforcements					
Geological					
BGS 1:625,000 Solid Geology	pg 38	Yes	n/a	n/a	n/a
BGS Recorded Mineral Sites	pg 38	1	6	6	21
CBSCB Compensation District			n/a	n/a	n/a
Coal Mining Affected Areas	pg 43	Yes	n/a	n/a	n/a
Mining Instability	pg 43	Yes	n/a	n/a	n/a
Man-Made Mining Cavities					
Natural Cavities					
Non Coal Mining Areas of Great Britain	pg 43	Yes	Yes	n/a	n/a
Potential for Collapsible Ground Stability Hazards	pg 44	Yes	Yes	n/a	n/a
Potential for Compressible Ground Stability Hazards	pg 44		Yes	n/a	n/a
Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 44	Yes	Yes	n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 44		Yes	n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 44	Yes	Yes	n/a	n/a
Radon Potential - Radon Affected Areas	pg 45	Yes	n/a	n/a	n/a
Radon Potential - Radon Protection Measures			n/a	n/a	n/a

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Industrial Land Use					
Contemporary Trade Directory Entries	pg 46		10	12	30
Fuel Station Entries	pg 50			1	2
Gas Pipelines					
Underground Electrical Cables					
Sensitive Land Use					
Ancient Woodland	pg 51			2	5
Areas of Adopted Green Belt	pg 51	1			
Areas of Unadopted Green Belt	pg 51				1
Areas of Outstanding Natural Beauty					
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves					
Marine Nature Reserves					
National Nature Reserves					
National Parks					
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones	pg 51	1			
Ramsar Sites					
Sites of Special Scientific Interest					
Special Areas of Conservation					
Special Protection Areas					
World Heritage Sites					

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NE (NE)	0	1	434780 401351
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NE (E)	0	1	434950 401350
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13SE (S)	9	1	434780 401250
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SE (S)	43	1	434780 401200
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NE (E)	47	1	435000 401350
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NE (NE)	53	1	435000 401450
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13SW (SW)	59	1	434550 401250
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NE (E)	99	1	435050 401450
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NE (NE)	114	1	434950 401600
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NE (E)	143	1	435100 401400
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NW (W)	147	1	434450 401351
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13SE (SE)	155	1	435000 401200
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A13SE (SE)	163	1	434900 401150
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13SE (E)	178	1	435100 401250
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13SE (SE)	181	1	434950 401150
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14SW (E)	203	1	435150 401300
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A18SE (NE)	225	1	435000 401700
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14NW (E)	246	1	435200 401350
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A18SE (NE)	261	1	434950 401750
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14SW (E)	266	1	435200 401250
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13SE (SE)	289	1	435100 401100
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A18SE (N)	310	1	434780 401800

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A14SW (E)	313	1	435250 401250
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A18SE (NE)	320	1	435000 401800
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14NW (NE)	322	1	435250 401550
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A8NE (S)	331	1	434900 400950
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A8NE (SE)	339	1	435000 401000
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14NW (E)	346	1	435300 401350
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14SW (SE)	351	1	435200 401100
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14SW (SE)	358	1	435250 401150
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A18SE (N)	359	1	434900 401850
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A12SE (SW)	390	1	434250 401100
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14NW (E)	393	1	435350 401351
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14NW (E)	393	1	435350 401400
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14NW (E)	396	1	435350 401350
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14SW (E)	409	1	435350 401250
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14NW (NE)	413	1	435300 401650
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8NE (S)	437	1	434850 400800
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A7NE (SW)	439	1	434250 401000
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A12SE (W)	455	1	434150 401250
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A9NW (SE)	458	1	435250 401000
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14NW (E)	496	1	435450 401350
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A12SW (W)	499	1	434100 401300

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Worsbrough Dale, West Street, WORSBROUGH Authority: Environment Agency, North East Region Catchment Area: Dearne Reference: S/UD/13 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge: Unknown Environment: Receiving Water: Not Supplied Status: Not Supplied Positional Accuracy: Located by supplier to within 100m</p>	A13SW (W)	96	2	434505 401305
1	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Worsbrough Dale, Bank End Avenue, WORSBROUGH Authority: Environment Agency, North East Region Catchment Area: Dearne Reference: S/UD/13 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge: Unknown Environment: Receiving Water: Not Supplied Status: Not Supplied Positional Accuracy: Located by supplier to within 100m</p>	A13SW (W)	97	2	434505 401300
1	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Worsbrough Bridge, Westfields, WORSBROUGH Authority: Environment Agency, North East Region Catchment Area: Dearne Reference: S/UD/13 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge: Unknown Environment: Receiving Water: Not Supplied Status: Not Supplied Positional Accuracy: Located by supplier to within 100m</p>	A13SW (W)	98	2	434505 401295
1	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: Sewerage Network - Sewers Location: Greenspring Avenue, BIRDWELL Authority: Environment Agency, North East Region Catchment Area: Dearne Reference: S/UD/13 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: 9th January 1963 Revocation Date: Not Supplied Discharge Type: Sewage Effluent Discharge-Storm Effluent Discharge: Unknown Environment: Receiving Water: Not Supplied Status: Not Supplied Positional Accuracy: Located by supplier to within 100m</p>	A13SW (W)	101	2	434500 401305

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Greenspring Avenue, Birdwell, WORSBROUGH Authority: Environment Agency, North East Region Catchment Area: Dearne Reference: S/UD/13 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge: Unknown Environment: Receiving Water: Not Supplied Status: Not Supplied Positional Accuracy: Located by supplier to within 100m</p>	A13SW (W)	102	2	434500 401300
1	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Blacker Lane, Blacker Hill, WORSBROUGH Authority: Environment Agency, North East Region Catchment Area: Dearne Reference: S/UD/13 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge: Unknown Environment: Receiving Water: Not Supplied Status: Not Supplied Positional Accuracy: Located by supplier to within 100m</p>	A13SW (W)	103	2	434500 401295
2	<p>Discharge Consents</p> <p>Operator: Wortley Construction Limited Property Type: PUMPING STATION ON SEWERAGE NETWORK (WATER COMPANY) Location: Birdwell Sewage Pumping Station, Plover Drive, Yorkshire Water Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: C4953 Permit Version: 1 Effective Date: 29th January 1988 Issued Date: 29th January 1988 Revocation Date: 12th March 2001 Discharge Type: Sewage Discharges - Pumping Station - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Culverted Trib Short Wood Dike Status: Transferred from COPA 1974 Positional Accuracy: Located by supplier to within 100m</p>	A18SE (N)	238	2	434800 401700
3	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: PUMPING STATION ON SEWERAGE NETWORK (WATER COMPANY) Location: Birdwell Sewage Pumping Station, Plover Drive, Yorkshire Water Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: C4953 Permit Version: 2 Effective Date: 13th March 2001 Issued Date: 13th March 2001 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Pumping Station - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Culverted Trib Short Wood Dike Status: Modified (Water Resources Act 1991, Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m</p>	A18SE (N)	282	2	434880 401770

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
4	<p>Discharge Consents</p> <p>Operator: Uk Coal Mining Limited Property Type: MINING OF COAL + LIGNITE Location: Rockingham Occs, Sheffield Road, Birdwell, Barnsley Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: Wa 6019 Permit Version: 2 Effective Date: 5th November 1990 Issued Date: 5th November 1990 Revocation Date: 4th June 1996 Discharge Type: Trade Discharges - Site Drainage (Contaminated Surface Water, Not Waste Sites) Discharge: Freshwater Stream/River Environment: Receiving Water: Short Wood Dike Status: Consent revoked: Discharge ceased (Water Resources Act 1991, Schedule 10 & 6) Positional Accuracy: Located by supplier to within 10m</p>	A14NW (E)	347	2	435300 401460
4	<p>Discharge Consents</p> <p>Operator: Uk Coal Mining Limited Property Type: MINING OF COAL + LIGNITE Location: Rockingham Occs, Sheffield Road, Birdwell, Barnsley Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: Wa 6019 Permit Version: 1 Effective Date: 14th May 1990 Issued Date: 14th May 1990 Revocation Date: 4th November 1990 Discharge Type: Trade Discharges - Site Drainage (Contaminated Surface Water, Not Waste Sites) Discharge: Freshwater Stream/River Environment: Receiving Water: Short Wood Dike Status: Transferred from Water Act 1989 Positional Accuracy: Located by supplier to within 100m</p>	A14NW (E)	347	2	435300 401460
4	<p>Discharge Consents</p> <p>Operator: British Coal Opencast Property Type: MINING OF COAL + LIGNITE Location: Rockingham Occs, Sheffield Road, Birdwell, Barnsley Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: Wa 6018 Permit Version: 1 Effective Date: 14th May 1990 Issued Date: 14th May 1990 Revocation Date: 30th August 1995 Discharge Type: Trade Effluent Discharge: Freshwater Stream/River Environment: Receiving Water: Not Supplied Status: Consent revoked: Discharge ceased (Water Resources Act 1991, Schedule 10 & 6) Positional Accuracy: Located by supplier to within 10m</p>	A14NW (E)	347	2	435300 401460
5	<p>Discharge Consents</p> <p>Operator: British Coal Corporation Property Type: Undefined Or Other Location: Rockingham Pumping Station Upper Hoyland, Birdwell, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: 3703 Permit Version: 1 Effective Date: 6th June 1983 Issued Date: 6th June 1983 Revocation Date: 9th June 1983 Discharge Type: Trade Effluent Discharge: Not Supplied Environment: Receiving Water: Not Supplied Status: Authorisation revoked Positional Accuracy: Located by supplier to within 100m</p>	A14SW (E)	378	2	435300 401200

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
6	<p>Discharge Consents</p> <p>Operator: Susan Robinson Property Type: DOMESTIC PROPERTY (MULTIPLE) (INCL FARM HOUSES) Location: 6 Wentworth Cottages, Hay Green Lane, Birdwell, Barnsley Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: C4121 Permit Version: 1 Effective Date: 24th January 1986 Issued Date: 24th January 1986 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Short Wood Dike Status: Transferred from COPA 1974 Positional Accuracy: Located by supplier to within 100m</p>	A14NW (NE)	388	2	435300 401600
7	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: STORM TANK/CSO ON SEWERAGE NETWORK (WATER COMPANY) Location: Green Spring Avenue Cso Opp 19 Green Spring Avenue, Birdwell, Barnsley, South Yorkshire, S70 5sd Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: C5340 Permit Version: 2 Effective Date: 28th March 2003 Issued Date: 28th March 2003 Revocation Date: 30th March 2018 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Tributary Of Short Wood Dike Status: Modified (Water Resources Act 1991, Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m</p>	A18SE (N)	392	2	434870 401880
7	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: STORM TANK/CSO ON SEWERAGE NETWORK (WATER COMPANY) Location: Green Spring Avenue Cso Opp 19 Green Spring Avenue, Birdwell, Barnsley, South Yorkshire, S70 5sd Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: C5340 Permit Version: 1 Effective Date: 30th August 1988 Issued Date: 30th August 1988 Revocation Date: 27th March 2003 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Tributary Of Short Wood Dike Status: Transferred from COPA 1974 Positional Accuracy: Located by supplier to within 100m</p>	A18SE (N)	392	2	434870 401880
7	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: STORM TANK/CSO ON SEWERAGE NETWORK (WATER COMPANY) Location: Green Spring Avenue Cso Opp 19 Green Spring Avenue, Birdwell, Barnsley, South Yorkshire, S70 5sd Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: C5340 Permit Version: 3 Effective Date: 31st March 2018 Issued Date: 21st February 2018 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Tributary Of Short Wood Dike Status: Varied under EPR 2010 Positional Accuracy: Located by supplier to within 10m</p>	A18SE (N)	395	2	434875 401884

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
8	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: PUMPING STATION ON SEWERAGE NETWORK (WATER COMPANY) Location: Cock Inn Sewage Pumping Stn End Of Chapel Street, Worsborough, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: Wra7785 Permit Version: 1 Effective Date: 26th February 2002 Issued Date: 26th February 2002 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Pumping Station - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Warren Dyke Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m</p>	A7NE (SW)	515	2	434200 400940
9	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: Sewage Disposal Works - Water Company Location: Tankersley Stw, Nr Worsborough, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: E698 (Ss) Permit Version: 1 Effective Date: 7th November 1989 Issued Date: 7th November 1989 Revocation Date: 31st March 1991 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Birdwell Dyke Status: Transferred from Water Act 1989 Positional Accuracy: Located by supplier to within 100m</p>	A7NE (SW)	549	2	434300 400800
9	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: Sewage Disposal Works - Water Company Location: Tankersley Stw, Nr Worsborough, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: E698 (Ss) Permit Version: 1 Effective Date: 7th November 1989 Issued Date: 7th November 1989 Revocation Date: 31st March 1991 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Birdwell Dyke Status: Transferred from Water Act 1989 Positional Accuracy: Located by supplier to within 100m</p>	A7NE (SW)	549	2	434300 400800
9	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: Sewage Disposal Works - Water Company Location: Tankersley Stw, Nr Worsborough, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: E698 (Ss) Permit Version: 3 Effective Date: 1st April 1992 Issued Date: 7th November 1989 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Birdwell Dyke Status: Transferred from Water Act 1989 Positional Accuracy: Located by supplier to within 100m</p>	A7NE (SW)	549	2	434300 400800

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
9	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: Sewage Disposal Works - Water Company Location: Tankersley Stw, Nr Worsborough, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: E698 (Ss) Permit Version: 3 Effective Date: 1st April 1992 Issued Date: 7th November 1989 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Birdwell Dyke Status: Transferred from Water Act 1989 Positional Accuracy: Located by supplier to within 100m</p>	A7NE (SW)	549	2	434300 400800
9	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Tankersley Sewage Treatment Works Lidgett Lane, Tankersley, Barnsley, South Yorkshire, S75 3bs Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: E698(Ss) Permit Version: 1 Effective Date: 16th November 1981 Issued Date: 16th November 1981 Revocation Date: 23rd March 2004 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge: Ditch Environment: Receiving Water: Birdwell Dyke Status: Transferred from Rivers (Prevention of Pollution) Act 1951-1961 Positional Accuracy: Located by supplier to within 100m</p>	A7NE (SW)	549	2	434300 400800
9	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Tankersley Sewage Treatment Works Lidgett Lane, Tankersley, Barnsley, South Yorkshire, S75 3bs Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: E698(Ss) Permit Version: 3 Effective Date: 1st April 2009 Issued Date: 14th October 2008 Revocation Date: 26th March 2018 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Birdwell Dyke Status: Modified (Water Resources Act 1991, Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m</p>	A7NE (SW)	571	2	434271 400793
9	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Tankersley Sewage Treatment Works Lidgett Lane, Tankersley, Barnsley, South Yorkshire, S75 3bs Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: E698(Ss) Permit Version: 3 Effective Date: 1st April 2009 Issued Date: 14th October 2008 Revocation Date: 26th March 2018 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Birdwell Dyke Status: Modified (Water Resources Act 1991, Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m</p>	A7NE (SW)	571	2	434271 400793

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
9	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Tankersley Sewage Treatment Works Lidgett Lane, Tankersley, Barnsley, South Yorkshire, S75 3bs</p> <p>Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: E698(Ss) Permit Version: 4 Effective Date: 27th March 2018 Issued Date: 27th March 2018 Revocation Date: 31st March 2018 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Birdwell Dyke Status: Varied under EPR 2010 Positional Accuracy: Located by supplier to within 10m</p>	A7NE (SW)	574	2	434269 400791
9	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Tankersley Sewage Treatment Works Lidgett Lane, Tankersley, Barnsley, South Yorkshire, S75 3bs</p> <p>Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: E698(Ss) Permit Version: 6 Effective Date: 31st March 2020 Issued Date: 27th March 2018 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Birdwell Dyke Status: Varied under EPR 2010 Positional Accuracy: Located by supplier to within 10m</p>	A7NE (SW)	574	2	434269 400791
9	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Tankersley Sewage Treatment Works Lidgett Lane, Tankersley, Barnsley, South Yorkshire, S75 3bs</p> <p>Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: E698(Ss) Permit Version: 4 Effective Date: 27th March 2018 Issued Date: 27th March 2018 Revocation Date: 31st March 2018 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Birdwell Dyke Status: Varied under EPR 2010 Positional Accuracy: Located by supplier to within 10m</p>	A7NE (SW)	574	2	434269 400791
9	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Tankersley Sewage Treatment Works Lidgett Lane, Tankersley, Barnsley, South Yorkshire, S75 3bs</p> <p>Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: E698(Ss) Permit Version: 5 Effective Date: 1st April 2018 Issued Date: 27th March 2018 Revocation Date: 30th March 2020 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Birdwell Dyke Status: Varied under EPR 2010 Positional Accuracy: Located by supplier to within 10m</p>	A7NE (SW)	574	2	434269 400791

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
9	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Tankersley Sewage Treatment Works Lidgett Lane, Tankersley, Barnsley, South Yorkshire, S75 3bs Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: E698(Ss) Permit Version: 5 Effective Date: 1st April 2018 Issued Date: 27th March 2018 Revocation Date: 30th March 2020 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Birdwell Dyke Status: Varied under EPR 2010 Positional Accuracy: Located by supplier to within 10m</p>	A7NE (SW)	574	2	434269 400791
9	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Tankersley Sewage Treatment Works Lidgett Lane, Tankersley, Barnsley, South Yorkshire, S75 3bs Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: E698(Ss) Permit Version: 6 Effective Date: 31st March 2020 Issued Date: 27th March 2018 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Birdwell Dyke Status: Varied under EPR 2010 Positional Accuracy: Located by supplier to within 10m</p>	A7NE (SW)	574	2	434269 400791
10	<p>Discharge Consents</p> <p>Operator: Gb Truck Services Property Type: Undefined Or Other Location: Cross Key Lane Works, Hoyland Common, Barnsley Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: Wra7281 Permit Version: 1 Effective Date: 28th January 1997 Issued Date: 28th January 1997 Revocation Date: 28th October 2015 Discharge Type: Trade Discharges - Site Drainage (Contaminated Surface Water, Not Waste Sites) Discharge: Freshwater Stream/River Environment: Receiving Water: Short Wood Dyke Status: Authorisation revoked Positional Accuracy: Located by supplier to within 100m</p>	A9SW (SE)	825	2	435300 400600
10	<p>Discharge Consents</p> <p>Operator: Gb Truck Services Property Type: Undefined Or Other Location: Cross Key Lane Works, Hoyland Common, Barnsley Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: C5082 Permit Version: 2 Effective Date: 21st June 1994 Issued Date: 21st June 1994 Revocation Date: 1st October 1996 Discharge Type: Trade Discharges - Site Drainage (Contaminated Surface Water, Not Waste Sites) Discharge: Freshwater Stream/River Environment: Receiving Water: Trib Of Shortbridge Dyke Status: Lapsed (under Environment Act 1995, Schedule 23) Positional Accuracy: Located by supplier to within 100m</p>	A9SW (SE)	825	2	435300 400600

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
10	<p>Discharge Consents</p> <p>Operator: Gb Truck Services Property Type: Undefined Or Other Location: Cross Key Lane Works, Hoyland Common, Barnsley Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: C5082 Permit Version: 1 Effective Date: 13th May 1988 Issued Date: 13th May 1988 Revocation Date: 20th June 1994 Discharge Type: Trade Discharges - Site Drainage (Contaminated Surface Water, Not Waste Sites) Discharge: Freshwater Stream/River Environment: Receiving Water: Trib Of Shortbridge Dyke Status: Transferred from COPA 1974 Positional Accuracy: Located by supplier to within 100m</p>	A9SW (SE)	825	2	435300 400600
11	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Shortwood Stw Shortwood, Near Worsborough, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: 2471 Permit Version: 3 Effective Date: 1st October 1985 Issued Date: 1st October 1985 Revocation Date: 9th March 2006 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Shortwood Dyke Status: Revoked (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 100m</p>	A19SE (NE)	852	2	435600 402000
11	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Shortwood Stw Shortwood, Near Worsborough, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: 2471 Permit Version: 2 Effective Date: 1st June 1981 Issued Date: 1st June 1981 Revocation Date: 30th September 1985 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Shortwood Dyke Status: Transferred from 1978 Order Positional Accuracy: Located by supplier to within 100m</p>	A19SE (NE)	852	2	435600 402000
11	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Shortwood Stw Shortwood, Near Worsborough, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: 2471 Permit Version: 2 Effective Date: 1st June 1981 Issued Date: 1st June 1981 Revocation Date: 30th September 1985 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Shortwood Dyke Status: Transferred from 1978 Order Positional Accuracy: Located by supplier to within 100m</p>	A19SE (NE)	852	2	435600 402000

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
11	<p>Discharge Consents</p> <p>Operator: Hoyland Nether Urban District Council Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Shortwood Stw Shortwood, Near Worsborough, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: 2471 Permit Version: 1 Effective Date: 10th February 1969 Issued Date: 10th February 1969 Revocation Date: 31st May 1981 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Shortwood Dyke Status: Transferred from Rivers (Prevention of Pollution) Act 1951-1961 Positional Accuracy: Located by supplier to within 100m</p>	A19SE (NE)	852	2	435600 402000
11	<p>Discharge Consents</p> <p>Operator: Hoyland Nether Urban District Council Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Shortwood Stw Shortwood, Near Worsborough, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: 2471 Permit Version: 1 Effective Date: 10th February 1969 Issued Date: 10th February 1969 Revocation Date: 31st May 1981 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Shortwood Dyke Status: Transferred from Rivers (Prevention of Pollution) Act 1951-1961 Positional Accuracy: Located by supplier to within 100m</p>	A19SE (NE)	852	2	435600 402000
12	<p>Discharge Consents</p> <p>Operator: G.B. Truck Services Ltd Property Type: WAREHOUSING + SUPPORT ACTIVITIES FOR TRANSPORTATION Location: G.B. Trucks Services Ltd Cross Keys Works, Cross Keys Lane, Hoyland Land, Barnsley, S74 0qa Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: S/P/1181 Permit Version: 1 Effective Date: 19th May 1963 Issued Date: 19th May 1963 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Short Wood Dike Status: Undetermined 1961 Application Positional Accuracy: Located by supplier to within 10m</p>	A9SW (SE)	867	2	435272 400542
13	<p>Discharge Consents</p> <p>Operator: Yorkshire Water Services Ltd Property Type: STORM TANK/CSO ON SEWERAGE NETWORK (WATER COMPANY) Location: Woodbine Cottages New Road/Lidget Lane (End Of), Tankersley, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: Wra7987 Permit Version: 1 Effective Date: 31st March 2004 Issued Date: 3rd February 2004 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Birdwell Dike Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m</p>	A2NE (S)	917	2	434430 400330

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
14	<p>Local Authority Pollution Prevention and Controls</p> <p>Name: Jay Cleaners Location: 1a Worsborough Road, Birdwell, Barnsley, S70 5qr Authority: Barnsley Metropolitan Borough Council, Environmental Health and Trading Standards Permit Reference: ppc/b/82 Dated: 22nd August 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning Status: Permitted Positional Accuracy: Located by supplier to within 10m</p>	A13NW (NW)	281	3	434580 401643
15	<p>Local Authority Pollution Prevention and Controls</p> <p>Name: Hilltop Service Station Location: Sheffield Road, Birdwell, BARNSLEY, South Yorkshire, S70 5XB Authority: Barnsley Metropolitan Borough Council, Environmental Health and Trading Standards Permit Reference: PPC/B/89 Dated: 25th January 2002 Process Type: Local Authority Air Pollution Control Description: PG1/14 Petrol filling station Status: Authorised Positional Accuracy: Automatically positioned to the address</p>	A18SW (NW)	465	3	434478 401797
16	<p>Local Authority Pollution Prevention and Controls</p> <p>Name: Hartwood Exports (Machinery) Ltd Location: Hangmanstone Depot, Sheffield Road, Birdwell, BARNSLEY, South Yorkshire, S70 5TR Authority: Barnsley Metropolitan Borough Council, Environmental Health and Trading Standards Permit Reference: Ppc/B/14 Dated: 20th January 1998 Process Type: Local Authority Pollution Prevention and Control Description: PG1/1Waste oil burners, less than 0.4MW net rated thermal input Status: Authorisation certificate surrendered by operator Positional Accuracy: Automatically positioned to the address</p>	A8SW (S)	619	3	434716 400589
17	<p>Local Authority Pollution Prevention and Controls</p> <p>Name: G B Trucks Ltd Location: Cross Keys Works, Cross Keys Lane, Hoyland, Barnsley, South Yorkshire, S74 0QA Authority: Barnsley Metropolitan Borough Council, Environmental Health and Trading Standards Permit Reference: Ppc/B/40 Dated: 14th July 1995 Process Type: Local Authority Pollution Prevention and Control Description: PG6/34 Respraying of road vehicles Status: Permitted Positional Accuracy: Automatically positioned to the address</p>	A9SW (SE)	867	3	435272 400542
18	<p>Local Authority Pollution Prevention and Controls</p> <p>Name: British Coal Corporation Location: Sheffield Road, Hoyland, Barnsley, S74 Authority: Barnsley Metropolitan Borough Council, Environmental Health and Trading Standards Permit Reference: Not Supplied Dated: Not Supplied Process Type: Local Authority Air Pollution Control Description: PG3/5 Coal, coke and coal product processes Status: Authorisation revoked Positional Accuracy: Manually positioned to the road within the address or location</p>	A9SW (SE)	961	3	435201 400392
	Nearest Surface Water Feature	A13NE (NE)	180	-	435025 401635
19	<p>Pollution Incidents to Controlled Waters</p> <p>Property Type: Water Company Sewage: Sewage Treatment Works Location: Shortwood Works Authority: Environment Agency, North East Region Pollutant: Sewage - Septic Tank Effluent Note: Blacker Dyke; Fish Killed: No Information Incident Date: 24th September 1998 Incident Reference: SH980412 Catchment Area: Dearne Tributaries Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m</p>	A14NW (E)	354	2	435300 401500

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
20	Pollution Incidents to Controlled Waters Property Type: Water Company Sewage: Other Location: Pilley Lane, BIRDWELL Authority: Environment Agency, North East Region Pollutant: Unknown Sewage Note: Rockley Dike; Fish Killed: No Information Incident Date: 23rd July 1998 Incident Reference: SH980294 Catchment Area: Dearne Tributaries Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A7NE (SW)	481	2	434200 401000
21	Pollution Incidents to Controlled Waters Property Type: Chemical industry Location: Rockingham Business Park, BIRDWELL Authority: Environment Agency, North East Region Pollutant: Chemicals - Unknown Note: Pollution Found; Fish Killed: No Information Incident Date: 4th July 1996 Incident Reference: SH960338 Catchment Area: Dearne Tributaries Receiving Water: Freshwater Stream/River Cause of Incident: Unknown Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A8NE (S)	549	2	434900 400700
22	Pollution Incidents to Controlled Waters Property Type: Industrial: Other Location: Chapman Drums, Rockingham Row, Birdwell, BARNSLEY Authority: Environment Agency, North East Region Pollutant: Chemicals - Solvents Note: Pollution Found; No Fish Killed Incident Date: 4th November 1996 Incident Reference: SH960475 Catchment Area: Dearne Tributaries Receiving Water: Freshwater Stream/River Cause of Incident: Unknown Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A8NE (S)	551	2	435001 400751
23	Pollution Incidents to Controlled Waters Property Type: Industrial Premises Location: Markers Bridge B6273, /Darfd A635 Dearne 08 Authority: Environment Agency, North East Region Pollutant: Not Given Note: Not Supplied Incident Date: 11th December 1992 Incident Reference: 139886 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A9NW (SE)	567	2	435300 400900
24	Pollution Incidents to Controlled Waters Property Type: Farm Location: Netherwood Brdg/Aldham A633 Dove(S) 03 Authority: Environment Agency, North East Region Pollutant: Agricultural: Yard Run Off (Dirty Water) Note: Not Supplied Incident Date: 15th March 1993 Incident Reference: 145168 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A8SE (S)	642	2	434900 400600
25	Pollution Incidents to Controlled Waters Property Type: Industrial: Other Location: Shortwood Dyke, ROCKINGHAM Authority: Environment Agency, North East Region Pollutant: Unknown Note: No Fish Killed Incident Date: 6th February 1995 Incident Reference: SH950184 Catchment Area: Dearne Tributaries Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A8SE (S)	716	2	434800 400500

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
26	Pollution Incidents to Controlled Waters Property Type: Industrial Premises Location: Darfield/Source Dove(S) Afu Authority: Environment Agency, North East Region Pollutant: Miscellaneous - Colour Note: Not Supplied Incident Date: 26th July 1993 Incident Reference: 147990 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A8SE (S)	738	2	434900 400500
27	Pollution Incidents to Controlled Waters Property Type: Highway/Car Park Location: Darfield/Source Dove(S) Afu Authority: Environment Agency, North East Region Pollutant: Oils - Unknown Note: Not Supplied Incident Date: 30th October 1991 Incident Reference: 127839 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A17SW (W)	872	2	433800 401700
28	Pollution Incidents to Controlled Waters Property Type: Farm Location: Mouth/Source Wiske Af Authority: Environment Agency, North East Region Pollutant: Silage Liquor Note: Not Supplied Incident Date: 7th June 1993 Incident Reference: 145363 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A9SW (SE)	916	2	435300 400500
	River Quality Name: Blacker_Dyke GQA Grade: River Quality C Reach: Rockingham_Colliery_River_Dov Estimated Distance (km): 2.9 Flow Rate: Flow less than 0.31 cumecs Flow Type: River Year: 2000	A14NW (E)	204	2	435161 401351
	River Quality Name: Warren_Dyke GQA Grade: River Quality D Reach: Lower_Pilley_Rockley_Dyk Estimated Distance (km): 2.4 Flow Rate: Flow less than 0.31 cumecs Flow Type: River Year: 2000	A12SE (SW)	399	2	434243 401093
29	Substantiated Pollution Incident Register Authority: Environment Agency - North East Region, Yorkshire Area Incident Date: 18th July 2003 Incident Reference: 174964 Water Impact: Category 1 - Major Incident Air Impact: Category 3 - Minor Incident Land Impact: Category 4 - No Impact Positional Accuracy: Located by supplier to within 10m Pollutant: Crude Sewage	A7NE (SW)	611	2	434254 400757

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	<p>Water Abstractions</p> <p>Operator: Mr H Brown Licence Number: 2/27/08/040 Permit Version: 100 Location: Well - Coal Measures - Worsborough Authority: Environment Agency, North East Region Abstraction: General Farming And Domestic Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): 1 Yearly Rate (m3): 303 Details: 3 Acres Farmland, Brownfield, Worsborough Village, Barnsley Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 27th January 1966 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m</p>	A23SE (N)	1115	2	434800 402600
	<p>Water Abstractions</p> <p>Operator: J B Hodgson Licence Number: 2/27/08/025 Permit Version: 100 Location: Dyke X4 - Worsborough Authority: Environment Agency, North East Region Abstraction: General Agriculture: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): 159 Yearly Rate (m3): 2728 Details: Rockley Abbey Farm, Worsborough Bridge, Barnsley Authorised Start: 01 May Authorised End: 30 September Permit Start Date: 14th December 1965 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m</p>	A16SE (NW)	1277	2	433500 402000
	<p>Water Abstractions</p> <p>Operator: Barnsley Metropolitan Borough Council Licence Number: 2/27/08/143 Permit Version: 1 Location: Rockley Dike Authority: Environment Agency, North East Region Abstraction: Municipal grounds: General use relating to Secondary Category (Very Low Loss) Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Worsborough Mill, Worsborough, Barnsley Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 14th February 2008 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m</p>	A22NE (N)	1408	2	434400 402800
	<p>Water Abstractions</p> <p>Operator: Barnsley Metropolitan Borough Council Licence Number: 2/27/08/118 Permit Version: 102 Location: Rockley Dike Authority: Environment Agency, North East Region Abstraction: Holiday Sites, Camp Sites & Tourist Attractions: Make-Up or Top Up Water Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Worsborough Mill, Worsborough, Barnsley Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st August 2002 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m</p>	A22NE (N)	1408	2	434400 402800

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	<p>Water Abstractions</p> <p>Operator: Barnsley Metropolitan Borough Council Licence Number: 2/27/08/118 Permit Version: 101 Location: Rockley Dike Authority: Environment Agency, North East Region Abstraction: Holiday sites, Camp Sites & Tourist Attractions: Lake & Pond Throughflow Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Worsborough Mill, Worsborough, Barnsley Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 24th November 2000 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m</p>	A22NE (N)	1408	2	434400 402800
	<p>Water Abstractions</p> <p>Operator: Barnsley Metropolitan Borough Council Licence Number: Ne/027/0008/018 Permit Version: 1 Location: Rockley Dike Authority: Environment Agency, North East Region Abstraction: Municipal grounds: Transfer between sources Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 1st April 2017 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m</p>	A22NE (N)	1414	2	434416 402813
	<p>Water Abstractions</p> <p>Operator: Barnsley Metropolitan Borough Council Licence Number: Ne/027/0008/019 Permit Version: 1 Location: Worsborough Reservoir Authority: Environment Agency, North East Region Abstraction: Municipal grounds: Transfer between sources Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 1st April 2017 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m</p>	(N)	1809	2	434862 403299
	<p>Water Abstractions</p> <p>Operator: Barnsley Metropolitan Borough Council Licence Number: 2/27/08/143 Permit Version: 1 Location: Worsborough Mill Pond Authority: Environment Agency, North East Region Abstraction: Production Of Energy: Mechanical Non Electrical: Milling & Water Power Other Than Electricity Generation Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Worsborough Mill, Worsborough, Barnsley Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 14th February 2008 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m</p>	(N)	1809	2	434900 403300

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	<p>Water Abstractions</p> <p>Operator: Barnsley Metropolitan Borough Council Licence Number: 2/27/08/118 Permit Version: 102 Location: Worsborough Mill Pond Authority: Environment Agency, North East Region Abstraction: Production Of Energy: Mechanical Non Electrical: Milling & Water Power Other Than Electricity Generation</p> <p>Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Worsborough Mill, Worsborough, Barnsley Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st August 2002 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m</p>	(N)	1809	2	434900 403300
	<p>Water Abstractions</p> <p>Operator: Barnsley Metropolitan Borough Council Licence Number: 2/27/08/118 Permit Version: 101 Location: Worsborough Mill Pond Authority: Environment Agency, North East Region Abstraction: Production Of Energy: Mechanical Non Electrical: Milling & Water Power Other Than Electricity Generation</p> <p>Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Worsborough Mill, Worsborough, Barnsley Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 24th November 2000 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m</p>	(N)	1809	2	434900 403300
	<p>Water Abstractions</p> <p>Operator: Barnsley Metropolitan Borough Council Licence Number: 2/27/08/118 Permit Version: 100 Location: Worsborough Mill Pond Authority: Environment Agency, North East Region Abstraction: Production Of Energy: Mechanical Non Electrical: Milling & Water Power Other Than Electricity Generation</p> <p>Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): 0 Yearly Rate (m3): 0 Details: Worsborough Mill, Worsborough, Barnsley Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 4th July 1997 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m</p>	(N)	1809	2	434900 403300
	<p>Water Abstractions</p> <p>Operator: Worsbrough Bridge Sports & Development Association Licence Number: 2/27/08/129 Permit Version: 1 Location: Inland Water - River Dove Authority: Environment Agency, North East Region Abstraction: General Agriculture: Spray Irrigation - Direct</p> <p>Abstraction Type: Water may be abstracted from a river or stream reach, or a row of wellpoints Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Worsbrough Bridge Sports, Park Road, Worsbrough Bridge, Barnsley Authorised Start: 01 April Authorised End: 30 September Permit Start Date: 4th September 2002 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m</p>	(N)	1811	2	435000 403300

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	<p>Water Abstractions</p> <p>Operator: Barnsley Metropolitan Borough Council Licence Number: 2/27/08/143 Permit Version: 1 Location: Worsborough Reservoir Authority: Environment Agency, North East Region Abstraction: Municipal grounds: General use relating to Secondary Category (Very Low Loss)</p> <p>Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Worsborough Mill, Worsborough, Barnsley Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 14th February 2008 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m</p>	(N)	1813	2	434800 403300
	<p>Water Abstractions</p> <p>Operator: Barnsley Metropolitan Borough Council Licence Number: 2/27/08/118 Permit Version: 102 Location: Worsborough Reservoir Authority: Environment Agency, North East Region Abstraction: Holiday Sites, Camp Sites & Tourist Attractions: Make-Up or Top Up Water Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Worsborough Mill, Worsborough, Barnsley Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st August 2002 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m</p>	(N)	1813	2	434800 403300
	<p>Water Abstractions</p> <p>Operator: Barnsley Metropolitan Borough Council Licence Number: 2/27/08/118 Permit Version: 101 Location: Worsborough Reservoir Authority: Environment Agency, North East Region Abstraction: Holiday sites, Camp Sites & Tourist Attractions: Lake & Pond Throughflow Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Worsborough Mill, Worsborough, Barnsley Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 24th November 2000 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m</p>	(N)	1813	2	434800 403300
	<p>Water Abstractions</p> <p>Operator: Barnsley Metropolitan Borough Council Licence Number: 2/27/08/118 Permit Version: 100 Location: Worsborough Reservoir Authority: Environment Agency, North East Region Abstraction: Production Of Energy: Mechanical Non Electrical: Milling & Water Power Other Than Electricity Generation</p> <p>Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Worsborough Mill, Worsborough, Barnsley Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 4th July 1997 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m</p>	(N)	1813	2	434800 403300

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Barnsley Metropolitan Borough Council Licence Number: 2/27/08/143/R01 Permit Version: 1 Location: Worsborough Mill Pond Authority: Environment Agency, North East Region Abstraction: Production Of Energy: Mechanical Non Electrical: Milling & Water Power Other Than Electricity Generation Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Worsborough Mill, Worsborough, Barnsley Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 1st April 2017 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(N)	1822	2	434947 403313
	Water Abstractions Operator: National Coal Board Licence Number: 2/27/08/066 Permit Version: Not Supplied Location: Location Description Not Available Authority: Environment Agency, North East Region Abstraction: General Industrial Abstraction Type: Not Supplied Source: Surface Daily Rate (m3): 1136 Yearly Rate (m3): 272760 Details: Licence Revoked Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	(N)	1922	2	435270 403380
	Groundwater Vulnerability Map Combined Classification: Secondary Bedrock Aquifer - Medium Vulnerability Combined Vulnerability: Medium Combined Aquifer: Productive Bedrock Aquifer, No Superficial Aquifer Pollutant Speed: Low Bedrock Flow: Well Connected Fractures Dilution: 300-550 mm/year Baseflow Index: <40% Superficial: <90% Patchiness: Superficial <3m Thickness: Superficial No Data Recharge:	A13NE (NE)	0	4	434780 401351
	Groundwater Vulnerability - Soluble Rock Risk None				
	Bedrock Aquifer Designations Aquifer Designation: Secondary Aquifer - A	A13NE (NE)	0	4	434780 401351
	Superficial Aquifer Designations No Data Available				
	Extreme Flooding from Rivers or Sea without Defences None				
	Flooding from Rivers or Sea without Defences None				
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
30	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 4.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A13SE (S)	237	5	434878 401055
31	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 65.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A13SE (S)	240	5	434883 401055
32	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 266.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A13SE (S)	240	5	434883 401055
33	OS Water Network Lines Watercourse Form: Lake Watercourse Length: 56.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14SW (E)	305	5	435258 401331
34	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 71.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14SW (E)	308	5	435260 401321
35	OS Water Network Lines Watercourse Form: Lake Watercourse Length: 13.6 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14NW (E)	314	5	435270 401373
36	OS Water Network Lines Watercourse Form: Lake Watercourse Length: 28.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14NW (E)	316	5	435273 401387
37	OS Water Network Lines Watercourse Form: Lake Watercourse Length: 10.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14NW (E)	318	5	435275 401415
38	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 18.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Short Wood Dike Catchment Name: Don and Rother Primacy: 1	A14NW (E)	329	5	435286 401417

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
39	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 75.8 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14SW (SE)	331	5	435215 401141
40	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 267.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14SW (SE)	331	5	435224 401160
41	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 142.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14SW (E)	332	5	435269 401249
42	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 16.9 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14SW (SE)	333	5	435140 401073
43	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 120.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A18SE (NE)	340	5	435010 401818
44	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 15.2 Watercourse Level: Underground Permanent: True Watercourse Name: Short Wood Dike Catchment Name: Don and Rother Primacy: 1	A14NW (E)	341	5	435297 401428
45	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 23.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Short Wood Dike Catchment Name: Don and Rother Primacy: 1	A14NW (E)	344	5	435299 401443
46	OS Water Network Lines Watercourse Form: Lake Watercourse Length: 37.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14SW (SE)	346	5	435156 401069
47	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 7.3 Watercourse Level: Underground Permanent: True Watercourse Name: Short Wood Dike Catchment Name: Don and Rother Primacy: 1	A14NW (E)	349	5	435300 401473

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
48	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 472.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Short Wood Dike Catchment Name: Don and Rother Primacy: 1	A14NW (E)	349	5	435300 401474
49	OS Water Network Lines Watercourse Form: Lake Watercourse Length: 11.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14SW (SE)	351	5	435191 401092
50	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 60.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A19SW (NE)	352	5	435167 401739
51	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 34.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14NW (E)	356	5	435311 401360
52	OS Water Network Lines Watercourse Form: Lake Watercourse Length: 96.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14SW (SE)	358	5	435190 401080
53	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 55.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14NW (E)	382	5	435338 401382
54	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 218.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A18SE (N)	392	5	434876 401884
55	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 63.7 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A19SW (NE)	408	5	435190 401795
56	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 111.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A18SE (NE)	418	5	435086 401873

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
57	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 158.7 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A9NW (SE)	453	5	435236 400995
58	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 15.3 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A19SW (NE)	458	5	435192 401858
59	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 3.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A19SW (NE)	466	5	435207 401856
60	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 263.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A19SW (NE)	468	5	435210 401855
61	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 64.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14SW (E)	471	5	435407 401225
62	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 27.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14SW (E)	498	5	435430 401209
63	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 398.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Warren Dike Catchment Name: Don and Rother Primacy: 1	A7NE (SW)	502	5	434187 400982
64	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 62.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A9NW (SE)	511	5	435228 400917
65	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 116.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14SE (E)	511	5	435459 401273

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
66	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 136.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Warren Dike Catchment Name: Don and Rother Primacy: 1	A12SE (SW)	515	5	434128 401070
67	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 39.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Warren Dike Catchment Name: Don and Rother Primacy: 1	A7NE (SW)	519	5	434156 401000
68	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 136.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14SE (E)	521	5	435459 401225
69	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 425.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Warren Dike Catchment Name: Don and Rother Primacy: 1	A12SW (W)	523	5	434094 401161
70	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 6.6 Watercourse Level: Underground Permanent: True Watercourse Name: Warren Dike Catchment Name: Don and Rother Primacy: 1	A12SW (W)	524	5	434095 401149
71	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 153.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14SE (E)	543	5	435469 401180
72	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 235.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14SW (SE)	556	5	435395 401013
73	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 17.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A9NW (SE)	598	5	435380 400930
74	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 101.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A9NW (SE)	605	5	435373 400914

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
75	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 114.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A9NW (SE)	605	5	435373 400914
76	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 88.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14NE (NE)	609	5	435511 401671
77	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 329.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A9NW (SE)	611	5	435332 400869
78	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 157.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A9NW (SE)	620	5	435161 400763
79	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 175.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A9NE (SE)	620	5	435452 400981
80	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 77.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A19SE (NE)	623	5	435517 401690
81	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 237.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A19SE (NE)	631	5	435512 401719
82	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 219.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A17SE (NW)	644	5	434147 401807
83	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 2.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Short Wood Dike Catchment Name: Don and Rother Primacy: 1	A19SW (NE)	644	5	435429 401882

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
84	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 325.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14NE (E)	645	5	435559 401648
85	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 31.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Short Wood Dike Catchment Name: Don and Rother Primacy: 1	A19SW (NE)	646	5	435430 401884
86	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 57.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Birdwell Dike Catchment Name: Don and Rother Primacy: 1	A7NE (SW)	648	5	434316 400677
87	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 357.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A9NW (SE)	653	5	435438 400909
88	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 117.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A9NW (SE)	658	5	435291 400783
89	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 180.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A9NW (SE)	661	5	435142 400710
90	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 114.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Short Wood Dike Catchment Name: Don and Rother Primacy: 1	A19SW (NE)	676	5	435449 401909
91	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 104.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14SE (E)	682	5	435586 401095
92	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 104.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 2	A14SE (E)	682	5	435586 401095

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
93	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 352.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Birdwell Dike Catchment Name: Don and Rother Primacy: 1	A7SE (SW)	688	5	434333 400622
94	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 41.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A17SW (W)	730	5	433955 401693
95	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 112.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A12NW (W)	737	5	433861 401389
96	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 84.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A12NW (W)	738	5	433861 401391
97	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 320.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14SE (E)	741	5	435669 401157
98	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 159.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Warren Dike Catchment Name: Don and Rother Primacy: 1	A12NW (W)	742	5	433865 401464
99	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 32.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A19SE (NE)	763	5	435544 401926
100	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 29.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 2	A19SE (NE)	763	5	435544 401926
101	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 451.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A17NE (NW)	770	5	434302 402056

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
102	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 137.0 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A17SW (NW)	771	5	433919 401712
103	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 76.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Short Wood Dike Catchment Name: Don and Rother Primacy: 1	A19SE (NE)	779	5	435541 401958
104	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 22.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A17SW (NW)	780	5	433937 401761
105	OS Water Network Lines Watercourse Form: Lake Watercourse Length: 36.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 2	A19SE (NE)	792	5	435570 401940
106	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 138.4 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A17SW (NW)	800	5	433915 401764
107	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 218.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Warren Dike Catchment Name: Don and Rother Primacy: 1	A12NW (W)	807	5	433828 401590
108	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 211.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A12NW (W)	812	5	433820 401581
109	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 19.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 2	A19SE (NE)	828	5	435599 401961
110	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 26.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A18NE (N)	831	5	435075 402307

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
111	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 61.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A19SE (NE)	831	5	435612 401946
112	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 149.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Short Wood Dike Catchment Name: Don and Rother Primacy: 1	A19SE (NE)	851	5	435595 402005
113	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 133.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A9NE (SE)	853	5	435654 400865
114	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 114.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A9NE (SE)	872	5	435665 400846
115	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 353.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A9NE (E)	879	5	435744 400965
116	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 16.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A8SW (S)	905	5	434441 400339
117	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 136.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Birdwell Dike Catchment Name: Don and Rother Primacy: 1	A7SE (S)	906	5	434439 400339
118	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 64.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Warren Dike Catchment Name: Don and Rother Primacy: 1	A17SW (NW)	908	5	433800 401781
119	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 84.3 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A9SE (SE)	909	5	435543 400658

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
120	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 5.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A3NW (S)	910	5	434453 400330
121	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 1.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A3NW (S)	914	5	434456 400325
122	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 110.1 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A3NW (S)	915	5	434457 400324
123	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 127.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A18NW (N)	923	5	434553 402339
124	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 43.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A9SE (SE)	928	5	435578 400663
125	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 355.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Warren Dike Catchment Name: Don and Rother Primacy: 1	A17SW (NW)	938	5	433803 401845
126	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 52.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A3NW (S)	956	5	434596 400257
127	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 7.3 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A9NE (SE)	972	5	435712 400742
128	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 2.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A15SW (E)	972	5	435927 401346

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
129	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 5.8 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 2	A15SW (E)	973	5	435929 401345
130	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 39.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 2	A15SW (E)	977	5	435933 401349
131	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 6.7 Watercourse Level: Underground Permanent: True Watercourse Name: Short Wood Dike Catchment Name: Don and Rother Primacy: 1	A19NE (NE)	977	5	435699 402077
132	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 178.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A9NE (SE)	978	5	435715 400736
133	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 182.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Short Wood Dike Catchment Name: Don and Rother Primacy: 1	A19NE (NE)	984	5	435706 402079
134	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 84.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A9SE (SE)	993	5	435605 400600

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
135	<p>Historical Landfill Sites</p> <p>Licence Holder: Hartwood Exports Location: Adjoining premises of Hartwood Exports (Machinery) Limited, Sheffield Road, Birdwell, Barnsley Name: British Rail Railway Cutting Operator Location: Sheffield Road, Birdwell, Barnsley Boundary Accuracy: As Supplied Provider Reference: EAHLD04408 First Input Date: 31st May 1983 Last Input Date: 31st December 1989 Specified Waste Type: Deposited Waste included Inert and Commercial Waste EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: 4400/0455 BGS Ref: Not Supplied Other Ref: WD20 B378, 4400/B378, 20B378(53), (36)B, 4400/(36), 4400/0439</p>	A8NE (S)	572	2	434955 400700
136	<p>Historical Landfill Sites</p> <p>Licence Holder: B D R Waste Disposal Limited Location: Birdwell, Barnsley, South Yorkshire Name: Birdwell Common Quarry Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD04406 First Input Date: Not Supplied Last Input Date: Not Supplied Specified Waste Type: Not Supplied EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: 4400/0555 BGS Ref: Not Supplied Other Ref: WD20 D928, 4400/(153)</p>	A8SW (S)	611	2	434593 400606
137	<p>Historical Landfill Sites</p> <p>Licence Holder: Hoyland Marshall Limited Location: Upper Hoyland Road, Hoyland, Barnsley Name: Shortwood Operator Location: Shortwood, Hoyland, Barnsley Boundary Accuracy: As Supplied Provider Reference: EAHLD04874 First Input Date: 31st December 1962 Last Input Date: 31st December 1990 Specified Waste Type: Deposited Waste included Inert and Industrial Waste EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: 4400/0424 BGS Ref: Not Supplied Other Ref: 20B76(21), 4400/B76, WD20 B76</p>	A14NE (E)	765	2	435685 401650
138	<p>Licensed Waste Management Facilities (Locations)</p> <p>Licence Number: 60553 Location: Hangmanstone Depot, Sheffield Road, Birdwell, Barnsley, South Yorkshire, S70 5TR Operator Name: Hartwood Estates Ltd Operator Location: Not Supplied Authority: Environment Agency - North East Region, Yorkshire Area Site Category: Metal Recycling Sites (Vehicle Dismantlers) Licence Status: Surrendered Issued: 22nd November 1996 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: 16th February 2009 IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m</p>	A8SW (S)	629	2	434720 400580

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
139	<p>Licensed Waste Management Facilities (Locations)</p> <p>Licence Number: 65291 Location: Lidget Garage, Sheffield Road, Hoyland Common, Barnsley, South Yorkshire, S74 0EB Operator Name: Richard Adrian Goodwin Operator Location: Not Supplied Authority: Environment Agency - North East Region, Yorkshire Area Site Category: Physico-chemical Treatment Facilities Licence Status: Expired Issued: 5th April 2006 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m</p>	A3NE (S)	947	2	434990 400309
	<p>Local Authority Landfill Coverage</p> <p>Name: Barnsley Metropolitan Borough Council - Has supplied landfill data</p>		0	3	434780 401351
140	<p>Local Authority Recorded Landfill Sites</p> <p>Location: Not Supplied Reference: 153 Authority: Barnsley Metropolitan Borough Council, Environmental Health and Trading Standards Last Reported Status: Unknown Types of Waste: Not Supplied Date of Closure: Not Supplied Positional Accuracy: Positioned by the supplier Boundary Quality: Moderate</p>	A8SW (S)	539	3	434684 400669
141	<p>Local Authority Recorded Landfill Sites</p> <p>Location: Not Supplied Reference: 53 Authority: Barnsley Metropolitan Borough Council, Environmental Health and Trading Standards Last Reported Status: Unknown Types of Waste: Not Supplied Date of Closure: Not Supplied Positional Accuracy: Positioned by the supplier Boundary Quality: Moderate</p>	A8NE (S)	577	3	434961 400697
142	<p>Local Authority Recorded Landfill Sites</p> <p>Location: Not Supplied Reference: 36 Authority: Barnsley Metropolitan Borough Council, Environmental Health and Trading Standards Last Reported Status: Unknown Types of Waste: Not Supplied Date of Closure: Not Supplied Positional Accuracy: Positioned by the supplier Boundary Quality: Moderate</p>	A8SW (S)	690	3	434731 400519
143	<p>Local Authority Recorded Landfill Sites</p> <p>Location: Not Supplied Reference: 21 Authority: Barnsley Metropolitan Borough Council, Environmental Health and Trading Standards Last Reported Status: Unknown Types of Waste: Not Supplied Date of Closure: Not Supplied Positional Accuracy: Positioned by the supplier Boundary Quality: Moderate</p>	A14NE (E)	780	3	435712 401612

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
144	<p>Registered Landfill Sites</p> <p>Licence Holder: Hartwood Exports (Machinery) Licence Reference: WD20 B 378 Site Location: Railway Cutting At Sheffield Road, Birdwell, Barnsley, South Yorkshire Licence Easting: 434900 Licence Northing: 400600 Operator Location: Sheffield Road, Birdwell, Barnsley, South Yorkshire Authority: Environment Agency - North East Region, Ridings Area Site Category: Landfill - Railway cutting Max Input Rate: Very Large (Equal to or greater than 250,000 tonnes per year) Waste Source: No known restriction on source of waste Restrictions: Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 1st May 1983 Preceded By: Not Given Licence: Superseded By: Not Given Licence: Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Clay,Subsoil,Topsoil Construction And Demolition Wastes Foundry Sand & Slag Hardcore Waste Ex Coal Processing Prohibited Waste: Asbestos Liquids In Containers Over 4l Cap. Slurry In Containers Over 4l Cap.</p>	A8SE (S)	642	2	434900 400600
145	<p>Registered Landfill Sites</p> <p>Licence Holder: G R Stein Refractories Ltd Licence Reference: WD20 B 76 Site Location: Marshall'S Hoyland Works, Shortwood, Hoyland, Barnsley, South Yorkshire, S74 9np Licence Easting: 435800 Licence Northing: 401650 Operator Location: As Site Address Authority: Environment Agency - North East Region, Ridings Area Site Category: Landfill Max Input Rate: Very Small (Less than 10,000 tonnes per year) Waste Source: No known restriction on source of waste Restrictions: Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 1st October 1979 Preceded By: Not Given Licence: Superseded By: Not Given Licence: Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Empty Used Containers Fired Refractory Clay &Non Flam.Tailing Ind. Non-Haz. Inert, Non-Flammable Prohibited Waste: Liquids In Containers Over 4l Cap. Slurry In Containers Over 4l Cap.</p>	A15NW (E)	875	2	435800 401650
146	<p>Registered Waste Transfer Sites</p> <p>Licence Holder: Deborah Tornese Licence Reference: WD20 B1036 Site Location: Unit 12 Rockingham Road, Birdwell, BARNSELEY, South Yorkshire, S70 5TU Operator Location: 12 Cranemoor Nook, Cranemoor, Wortley, Sheffield, South Yorkshire Authority: Environment Agency - North East Region, Ridings Area Site Category: Transfer Max Input Rate: Large (Equal to or greater than 75,000 and less than 250,000 tonnes per year) Waste Source: No known restriction on source of waste Restrictions: Licence Status: Site exempt from licenceExempt Dated: 1st December 1993 Preceded By: Not Given Licence: Superseded By: Not Given Licence: Positional Accuracy: Manually positioned to the address or location Boundary Quality: Not Supplied Authorised Waste: Empty Used Containers Max.Storage In Licence Prohibited Waste: Waste N.O.S.</p>	A8SE (S)	588	2	434930 400670

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
147	<p>Registered Waste Treatment or Disposal Sites</p> <p>Licence Holder: Hartwood Exports (Machinery) Ltd Licence Reference: WD20 B1120 MOD 2 Site Location: Hangmanstone Depot, Sheffield Road, Birdwell, BARNSLEY, South Yorkshire, S70 5TR</p> <p>Operator Location: As Site Address Authority: Environment Agency - North East Region, Ridings Area Site Category: Scrapyard Max Input Rate: Very Small (Less than 10,000 tonnes per year) Waste Source: No known restriction on source of waste</p> <p>Restrictions: Licence Status: Operational as far as is known Dated: 22nd November 1996 Preceded By: Not Given Licence: Superseded By: Not Given Licence:</p> <p>Positional Accuracy: Located by supplier to within 100m Boundary Quality: Not Supplied Authorised Waste: Max.Waste Permitted By Licence Scrap Motor Vehicles Max.Stor Scrap Tyres Max.Stor</p> <p>Prohibited Waste: Liquid Wastes Waste N.O.S.</p>	A8SW (S)	629	2	434720 400580



Hazardous Substances

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
148	Notification of Installations Handling Hazardous Substances (NIHHS) Name: Mercedes Benz (Uk) Ltd. Location: Wentworth Industrial Park, Tankersley, BARNSELEY, South Yorkshire Status: Not Active Positional Accuracy: Automatically positioned within the geographical locality	A11SE (W)	898	6	433700 401305

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Pennine Middle Coal Measures Formation And South Wales Middle Coal Measures Formation (Undifferentiated)	A13NE (NE)	0	1	434780 401351
149	BGS Recorded Mineral Sites Site Name: Hay Green Coal Workings Location: Birdwell, Worsbrough, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 204803 Type: Underground Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Swallow Wood Coal (West And South Yorkshire) Commodity: Coal - Opencast Positional Accuracy: Located by supplier to within 10m	A13SW (SW)	0	1	434690 401244
150	BGS Recorded Mineral Sites Site Name: Hay Green Lane Quarries Location: Birdwell, Worsbrough, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 204798 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Middle Coal Measures Formation Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A13NW (NW)	43	1	434725 401439
150	BGS Recorded Mineral Sites Site Name: Hay Green Lane Quarries Location: Birdwell, Worsbrough, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 204799 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Middle Coal Measures Formation Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A13NW (N)	82	1	434732 401478
151	BGS Recorded Mineral Sites Site Name: Hay Green Lane Quarries Location: Birdwell, Worsbrough, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 204801 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Middle Coal Measures Formation Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A13NE (N)	53	1	434838 401515
152	BGS Recorded Mineral Sites Site Name: Hay Green Lane Coal Pit Location: Birdwell, Worsbrough, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 204794 Type: Underground Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Swallow Wood Coal (West And South Yorkshire) Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m	A13NW (W)	59	1	434592 401404

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
153	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Hay Green Lane Quarries Location: Birdwell, Worsbrough, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 204800 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Middle Coal Measures Formation Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m</p>	A13NE (N)	91	1	434781 401521
154	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Hay Green Occs Location: Birdwell, Worsbrough, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 204804 Type: Underground Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Swallow Wood Coal (West And South Yorkshire) Commodity: Coal - Opencast Positional Accuracy: Located by supplier to within 10m</p>	A13SE (S)	144	1	434843 401145
155	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Wigfield Occs Location: Birdwell, Worsbrough, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 204802 Type: Underground Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Swallow Wood Coal (West And South Yorkshire) Commodity: Coal - Opencast Positional Accuracy: Located by supplier to within 10m</p>	A12NE (NW)	402	1	434270 401579
156	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Bird Well Common Location: Birdwell, Worsbrough, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 38056 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Middle Coal Measures Formation Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m</p>	A8NW (SW)	412	1	434498 400845
157	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Rockingham Occs Location: Hoyland, Barnsley, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 201 Type: Opencast Status: Ceased Operator: Rjb Mining (Uk) Ltd. Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Middle Coal Measures Formation Commodity: Coal - Opencast Positional Accuracy: Located by supplier to within 10m</p>	A8NE (SE)	424	1	435059 400932
158	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Rockingham Colliery, Swallow Wood Drift Location: Birdwell, Worsbrough, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 204822 Type: Underground Status: Ceased Operator: Individual'S Name Withheld Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Swallow Wood Coal (West And South Yorkshire) Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m</p>	A14SW (SE)	452	1	435333 401106

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
159	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Rockingham Colliery, No. 2 Shaft Location: Birdwell, Worsbrough, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 204821 Type: Underground Status: Ceased Operator: Individual'S Name Withheld Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Coal Measures Group Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m</p>	A14SW (SE)	471	1	435305 401036
159	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Rockingham Colliery, No. 1 Shaft Location: Hoyland, Barnsley, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 13310 Type: Underground Status: Ceased Operator: Individual'S Name Withheld Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Middle Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m</p>	A9NW (SE)	474	1	435276 401002
160	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Hay Royd Colliery Air Pit Location: Upper Hoyland, Hoyland, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 204793 Type: Underground Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Barnsley Coal (West And South Yorkshire) Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m</p>	A19SW (NE)	542	1	435350 401817
161	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Singleton Wood Location: Upper Hoyland, Hoyland, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 38055 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Middle Coal Measures Formation Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m</p>	A14SW (E)	547	1	435447 401114
162	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Birdwell Lodge Coal Mine Location: Birdwell, Worsbrough, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 108286 Type: Underground Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Lidget Coal (West And South Yorkshire) Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m</p>	A7NE (SW)	559	1	434114 400993
163	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Birdwell Lodge Coal Mine Location: Birdwell, Worsbrough, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 204796 Type: Underground Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Lidget Coal (West And South Yorkshire) Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m</p>	A7NE (SW)	579	1	434194 400850

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
164	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Birdwell Location: Hoyland, Barnsley, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 13311 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Middle Coal Measures Formation Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m</p>	A8SW (S)	614	1	434660 400595
165	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Birdwell Lodge Coal Mine Location: Birdwell, Worsbrough, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 204797 Type: Underground Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Lidget Coal (West And South Yorkshire) Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m</p>	A7NE (SW)	634	1	434131 400837
166	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Birdwell Location: Birdwell, Worsbrough, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 38044 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Middle Coal Measures Formation Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m</p>	A12NW (W)	634	1	434010 401585
167	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Birdwell Location: Birdwell, Worsbrough, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 38045 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Middle Coal Measures Formation Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m</p>	A17SE (NW)	650	1	434285 401916
168	<p>BGS Recorded Mineral Sites</p> <p>Site Name: High Royd Brick Works Location: Upper Hoyland, Hoyland, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 108221 Type: Opencast Status: Ceased Operator: Ffrith Fireclay Co., Ltd Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Middle Coal Measures Formation Commodity: Common Clay and Shale Positional Accuracy: Located by supplier to within 10m</p>	A14NE (E)	690	1	435645 401350
169	<p>BGS Recorded Mineral Sites</p> <p>Site Name: High Royd Brick Works Location: Hoyland, Barnsley, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 13309 Type: Opencast Status: Ceased Operator: Ffrith Fireclay Co., Ltd Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Middle Coal Measures Formation Commodity: Common Clay and Shale Positional Accuracy: Located by supplier to within 10m</p>	A14NE (E)	703	1	435655 401490

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
170	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Hay Royd Colliery Location: Upper Hoyland, Hoyland, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 38049 Type: Underground Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Barnsley Coal (West And South Yorkshire) Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m</p>	A14NE (E)	716	1	435652 401587
170	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Hay Royd Colliery Location: Upper Hoyland, Hoyland, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 204792 Type: Underground Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Barnsley Coal (West And South Yorkshire) Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m</p>	A14NE (E)	752	1	435681 401618
171	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Old Park Quarries Location: Worsbrough, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 205019 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Haigh Moor Rock Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m</p>	A12SW (W)	827	1	433776 401245
172	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Knoll Drift Mine Location: Tankersley Common, Hoyland, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 204805 Type: Underground Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Flockton Thick Coal (West And South Yorkshire) Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m</p>	A8SE (S)	831	1	434871 400396
172	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Knoll Drift Mine Location: Tankersley Common, Hoyland, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 204806 Type: Underground Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Flockton Thick Coal (West And South Yorkshire) Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m</p>	A8SE (S)	843	1	434912 400394
173	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Hay Royd Brick Works Location: Upper Hoyland, Hoyland, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 204791 Type: Opencast Status: Ceased Operator: Ffrith Fireclay Co., Ltd Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Middle Coal Measures Formation Commodity: Common Clay and Shale Positional Accuracy: Located by supplier to within 10m</p>	A15NW (E)	855	1	435810 401460

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
174	BGS Recorded Mineral Sites Site Name: Hoyland Common Occs Location: Hoyland Common, Worsbrough, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 235898 Type: Opencast Status: Ceased Operator: Individual'S Name Withheld Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Barnsley Coal (West And South Yorkshire) Commodity: Coal - Opencast Positional Accuracy: Located by supplier to within 10m	A9NE (SE)	895	1	435695 400850
175	BGS Recorded Mineral Sites Site Name: Old Park Quarries Location: Worsbrough, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 205018 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Haigh Moor Rock Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A11SE (W)	903	1	433695 401297
176	BGS Recorded Mineral Sites Site Name: Balk Location: Birdwell, Worsbrough, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 38047 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Middle Coal Measures Formation Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A18NW (N)	930	1	434469 402310
177	BGS Recorded Mineral Sites Site Name: Wigfield Wood Quarries Location: Birdwell, Worsbrough, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 205028 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Haigh Moor Rock Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A17NE (NW)	966	1	434110 402179
178	BGS Recorded Mineral Sites Site Name: Wigfield Wood Quarries Location: Birdwell, Worsbrough, South Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 205027 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Haigh Moor Rock Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A17NE (NW)	990	1	434137 402222
	Coal Mining Affected Areas Description: In an area which may be affected by coal mining activity. It is recommended that a coal mining report is obtained from the Coal Authority. Contact details are included in the Useful Contacts section of this report.	A13NE (NE)	0	7	434780 401351
	Mining Instability Mining Evidence: Inconclusive Coal Mining Source: Ove Arup & Partners Boundary Quality: As Supplied	A13NE (NE)	0	-	434780 401351
	Non Coal Mining Areas of Great Britain Risk: Highly Unlikely Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	434780 401351

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Non Coal Mining Areas of Great Britain Risk: Highly Unlikely Source: British Geological Survey, National Geoscience Information Service	A13NE (E)	43	1	435000 401351
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	434780 401351
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (E)	43	1	435000 401351
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	434780 401351
	Potential for Compressible Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13SE (S)	13	1	434783 401253
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (E)	43	1	435000 401351
	Potential for Compressible Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A12NE (W)	165	1	434435 401381
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	434780 401351
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (E)	43	1	435000 401351
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	434780 401351
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (E)	43	1	435000 401351
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	434780 401351
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (S)	13	1	434783 401253
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (E)	43	1	435000 401351
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A12NE (W)	165	1	434435 401381
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	434780 401351
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (W)	0	1	434697 401346
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	0	1	434794 401389
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (E)	43	1	435000 401362
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (E)	46	1	435000 401351
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (E)	47	1	435000 401434

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	66	1	434551 401221
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	211	1	435090 401613
	Radon Potential - Radon Affected Areas Affected Area: The property is in an Intermediate probability radon area (1 to 3% of homes are estimated to be at or above the Action Level). Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	434780 401351
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	434780 401351

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
179	<p>Contemporary Trade Directory Entries</p> <p>Name: Brettom Telecom Location: 51, Hay Green Lane, Birdwell, Barnsley, South Yorkshire, S70 5XA Classification: Telecommunications Equipment & Systems Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A13NE (N)	22	-	434799 401410
180	<p>Contemporary Trade Directory Entries</p> <p>Name: The Prestige Bodyshop Location: 113, Sheffield Road, Birdwell, Barnsley, S70 5TA Classification: Car Body Repairs Status: Active Positional Accuracy: Automatically positioned to the address</p>	A13SW (SW)	43	-	434591 401214
180	<p>Contemporary Trade Directory Entries</p> <p>Name: Central Garage Location: Sheffield Road, Birdwell, Barnsley, South Yorkshire, S70 5TA Classification: Car Body Repairs Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A13SW (SW)	80	-	434598 401175
180	<p>Contemporary Trade Directory Entries</p> <p>Name: Hilltop Garage Location: Sheffield Road, Birdwell, Barnsley, South Yorkshire, S70 5TA Classification: Garage Services Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A13SW (SW)	80	-	434598 401175
181	<p>Contemporary Trade Directory Entries</p> <p>Name: Imperial Damp Proofing Location: 30, Herons Way, Birdwell, Barnsley, South Yorkshire, S70 5SF Classification: Damp & Dry Rot Control Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A13NE (NE)	55	-	434884 401537
182	<p>Contemporary Trade Directory Entries</p> <p>Name: Shell Service Station Location: Sheffield Road, Birdwell, Barnsley, South Yorkshire, S70 5XB Classification: Petrol Filling Stations Status: Active Positional Accuracy: Automatically positioned to the address</p>	A13NW (W)	92	-	434511 401378
183	<p>Contemporary Trade Directory Entries</p> <p>Name: Rainford Developments Ltd Location: Wentworth Street, Barnsley, S Yorkshire, S70 5UN Classification: Fireplaces & Mantelpieces Status: Inactive Positional Accuracy: Manually positioned to the road within the address or location</p>	A13SW (SW)	186	-	434524 401088
184	<p>Contemporary Trade Directory Entries</p> <p>Name: Windows & Conservatories Location: 196, Sheffield Road, Birdwell, Barnsley, South Yorkshire, S70 5TD Classification: PVC-U Products - Manufacturers & Suppliers Status: Inactive Positional Accuracy: Manually positioned to the address or location</p>	A13SW (SW)	187	-	434578 401060
185	<p>Contemporary Trade Directory Entries</p> <p>Name: Barnsley Surfacing Co Ltd Location: 54, Sheffield Road, Birdwell, Barnsley, South Yorkshire, S70 5UY Classification: Asphalt & Coated Macadam Laying Contractors Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A13NW (NW)	209	-	434527 401542
185	<p>Contemporary Trade Directory Entries</p> <p>Name: Graham'S Autos Location: Sheffield Rd, Birdwell, Barnsley, South Yorkshire, S70 5XB Classification: Garage Services Status: Inactive Positional Accuracy: Manually positioned to the road within the address or location</p>	A13NW (NW)	243	-	434544 401582
186	<p>Contemporary Trade Directory Entries</p> <p>Name: Jays Cleaners Of Birdwell Location: 1, Worsbrough Road, Birdwell, Barnsley, South Yorkshire, S70 5QR Classification: Dry Cleaners Status: Active Positional Accuracy: Automatically positioned to the address</p>	A13NW (NW)	286	-	434588 401653
187	<p>Contemporary Trade Directory Entries</p> <p>Name: The Finishing Touch Location: 57, Green Spring Avenue, Birdwell, Barnsley, South Yorkshire, S70 5SW Classification: Fireplaces & Mantelpieces Status: Inactive Positional Accuracy: Manually positioned to the address or location</p>	A18SW (N)	349	-	434650 401745

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
187	<p>Contemporary Trade Directory Entries</p> <p>Name: The Finishing Touch Location: 57, Green Spring Avenue, Birdwell, Barnsley, South Yorkshire, S70 5SW Classification: Fireplaces & Mantelpieces Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A18SW (N)	349	-	434650 401745
188	<p>Contemporary Trade Directory Entries</p> <p>Name: Jumbo Self Drive Location: 2A, Sheffield Road, Birdwell, Barnsley, S70 5UZ Classification: Mot Testing Centres Status: Active Positional Accuracy: Automatically positioned to the address</p>	A18SW (NW)	405	-	434455 401725
188	<p>Contemporary Trade Directory Entries</p> <p>Name: Av Cranes Uk Ltd Location: 2a, Sheffield Road, Birdwell, Barnsley, South Yorkshire, S70 5UZ Classification: Crane Hire, Sales & Service Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A18SW (NW)	405	-	434455 401725
188	<p>Contemporary Trade Directory Entries</p> <p>Name: Graham'S Autos Location: 2a, Sheffield Road, Birdwell, Barnsley, S70 5UZ Classification: Garage Services Status: Active Positional Accuracy: Automatically positioned to the address</p>	A18SW (NW)	405	-	434455 401725
189	<p>Contemporary Trade Directory Entries</p> <p>Name: Talurit Uk Location: Unit 3, Kestrel Way, Birdwell, Barnsley, S70 5SZ Classification: Cutting Tools & Machinery Status: Active Positional Accuracy: Automatically positioned to the address</p>	A8NE (SE)	417	-	434990 400912
190	<p>Contemporary Trade Directory Entries</p> <p>Name: Esco Gb Location: Unit 2, Kestrel Way, Birdwell, Barnsley, S70 5SZ Classification: Laboratory Equipment, Instruments & Supplies Status: Active Positional Accuracy: Automatically positioned to the address</p>	A8NE (S)	441	-	434963 400860
191	<p>Contemporary Trade Directory Entries</p> <p>Name: A P U Executive Travel Location: 17, Timothy Wood Avenue, Birdwell, Barnsley, South Yorkshire, S70 5RX Classification: Car Engine Tuning & Diagnostic Services Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A18SW (N)	452	-	434700 401889
192	<p>Contemporary Trade Directory Entries</p> <p>Name: Hill Top Service Station Location: Sheffield Road, Birdwell, Barnsley, South Yorkshire, S70 5XB Classification: Petrol Filling Stations Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A18SW (NW)	465	-	434478 401797
192	<p>Contemporary Trade Directory Entries</p> <p>Name: Hilltop Service Station Location: Sheffield Road, Birdwell, Barnsley, South Yorkshire, S70 5XB Classification: Petrol Filling Stations Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A18SW (NW)	465	-	434478 401797
193	<p>Contemporary Trade Directory Entries</p> <p>Name: Twin Tub (Uk) Location: 247, Sheffield Road, Birdwell, Barnsley, South Yorkshire, S70 5TN Classification: Washing Machines - Servicing & Repairs Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A8NW (S)	466	-	434651 400744
194	<p>Contemporary Trade Directory Entries</p> <p>Name: Trekdale Transport Ltd Location: Rockingham Row, Birdwell, Barnsley, South Yorkshire, S70 5TW Classification: Road Haulage Services Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A8NE (S)	508	-	434799 400711
195	<p>Contemporary Trade Directory Entries</p> <p>Name: Grahams Autos Location: Sheffield Rd, Birdwell, Barnsley, South Yorkshire, S70 5XB Classification: Garage Services Status: Inactive Positional Accuracy: Manually positioned to the road within the address or location</p>	A17SE (NW)	525	-	434427 401842

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
196	<p>Contemporary Trade Directory Entries</p> <p>Name: The Partlow Partnership Location: Unit 6 Rockingham Row, Birdwell, Barnsley, South Yorkshire, S70 5TW Classification: Greeting Card Publishers & Wholesalers Status: Inactive Positional Accuracy: Manually positioned to the road within the address or location</p>	A8SW (S)	542	-	434760 400670
197	<p>Contemporary Trade Directory Entries</p> <p>Name: Bmw Breaking Centre Location: Unit 3, Rockingham Business Park, Rockingham Row, Birdwell, Barnsley, South Yorkshire, S70 5TW Classification: Car Breakers & Dismantlers Status: Inactive Positional Accuracy: Automatically positioned in the proximity of the address</p>	A8NE (S)	544	-	434852 400688
197	<p>Contemporary Trade Directory Entries</p> <p>Name: Company Shop Location: Rockingham Row, Birdwell, Barnsley, South Yorkshire, S70 5TW Classification: Food Products - Manufacturers Status: Inactive Positional Accuracy: Manually positioned to the road within the address or location</p>	A8NE (S)	545	-	434844 400684
197	<p>Contemporary Trade Directory Entries</p> <p>Name: Kia Services Location: Unit 4, Rockingham Business Park, Rockingham Row, Birdwell, Barnsley, S70 5TW Classification: Garage Services Status: Active Positional Accuracy: Automatically positioned to the address</p>	A8SE (S)	582	-	434838 400645
197	<p>Contemporary Trade Directory Entries</p> <p>Name: May Gurney Ltd Location: Unit 4, Rockingham Business Park, Rockingham Row, Birdwell, BARNSELEY, South Yorkshire, S70 5TW Classification: Sewage Disposal - Equipment & Service Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A8SE (S)	583	-	434836 400643
198	<p>Contemporary Trade Directory Entries</p> <p>Name: Colin Vaines & Sons Ltd Location: 2, The Walk, Birdwell, Barnsley, South Yorkshire, S70 5UA Classification: Road Haulage Services Status: Active Positional Accuracy: Automatically positioned to the address</p>	A8SW (S)	561	-	434629 400651
199	<p>Contemporary Trade Directory Entries</p> <p>Name: Birdwell Garage Location: Unit 6, Rockingham Business Park, Rockingham Row, Birdwell, Barnsley, South Yorkshire, S70 5TW Classification: Garage Services Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A8SE (S)	578	-	434875 400659
199	<p>Contemporary Trade Directory Entries</p> <p>Name: Scrap My Car Now For Barnsley Kws Location: Rockingham Row, Barnsley, South Yorkshire, S70 5TW Classification: Car Breakers & Dismantlers Status: Inactive Positional Accuracy: Manually positioned within the geographical locality</p>	A8SE (S)	579	-	434875 400659
199	<p>Contemporary Trade Directory Entries</p> <p>Name: Darwill Ltd Location: Unit 13, Rockingham Business Park, Rockingham Row, Birdwell, Barnsley, South Yorkshire, S70 5TW Classification: Crane Manufacturers Status: Active Positional Accuracy: Automatically positioned to the address</p>	A8SE (S)	584	-	434906 400665
199	<p>Contemporary Trade Directory Entries</p> <p>Name: W R Rack Solutions Ltd Location: Unit 13, Rockingham Business Park, Rockingham Row, Birdwell, Barnsley, South Yorkshire, S70 5TW Classification: Pallets, Crates & Packing Cases Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A8SE (S)	584	-	434906 400665
200	<p>Contemporary Trade Directory Entries</p> <p>Name: European Welding Supplies Ltd Location: Unit 3, Rockingham Business Park, Rockingham Row, Birdwell, Barnsley, S70 5TW Classification: Abrasive Products - Wholesalers Status: Active Positional Accuracy: Automatically positioned to the address</p>	A8SE (S)	580	-	434820 400642

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
201	<p>Contemporary Trade Directory Entries</p> <p>Name: Hartwood Exports (Machinery) Ltd Location: Hangmanstone Depot, Sheffield Road, Birdwell, Barnsley, South Yorkshire, S70 5TR Classification: Commercial Vehicle Servicing, Repairs, Parts & Accessories Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A8SW (S)	619	-	434716 400589
202	<p>Contemporary Trade Directory Entries</p> <p>Name: Remora Ltd Location: Unit 8a, Shortwood Court, Shortwood Business Park, Hoyland, Barnsley, South Yorkshire, S74 9LH Classification: Cable & Wire Equipment Manufacturers Status: Inactive Positional Accuracy: Manually positioned to the address or location</p>	A14NE (E)	627	-	435584 401420
202	<p>Contemporary Trade Directory Entries</p> <p>Name: Oracle Precision Ltd Location: Unit 7a, Shortwood Court, Shortwood Business Park, Hoyland, Barnsley, S74 9LH Classification: Precision Engineers Status: Active Positional Accuracy: Automatically positioned to the address</p>	A14NE (E)	643	-	435599 401372
203	<p>Contemporary Trade Directory Entries</p> <p>Name: Barber Of Sheffield Location: Unit 25-26, Shortwood Court, Shortwood Business Park, Hoyland, Barnsley, S74 9LH Classification: Veterinary Pharmacies Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A14NE (E)	679	-	435637 401421
204	<p>Contemporary Trade Directory Entries</p> <p>Name: Monarch Location: 5, Fairfield, Birdwell, Barnsley, South Yorkshire, S70 5RR Classification: Carpet, Curtain & Upholstery Cleaners Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A18NE (N)	695	-	434846 402182
205	<p>Contemporary Trade Directory Entries</p> <p>Name: Pro Display Location: Unit 5, Shortwood Court, Shortwood Business Park, Hoyland, Barnsley, South Yorkshire, S74 9LH Classification: Screen Manufacturers & Suppliers Status: Active Positional Accuracy: Automatically positioned to the address</p>	A14SE (E)	699	-	435645 401247
205	<p>Contemporary Trade Directory Entries</p> <p>Name: Talurit Location: Unit 4, Shortwood Ct, Shortwood Business Pk, Hoyland, Barnsley, South Yorkshire, S74 9LH Classification: Engineering Services Status: Inactive Positional Accuracy: Manually positioned to the address or location</p>	A14SE (E)	716	-	435666 401282
206	<p>Contemporary Trade Directory Entries</p> <p>Name: Elite Car Co Location: Unit 6a, Shortwood Court, Shortwood Business Park, Hoyland, Barnsley, South Yorkshire, S74 9LH Classification: Car Dealers - Used Status: Inactive Positional Accuracy: Manually positioned to the address or location</p>	A14SE (E)	700	-	435654 401330
207	<p>Contemporary Trade Directory Entries</p> <p>Name: Glass Resort Ltd Location: Unit 1, Shortwood Court, Shortwood Business Park, Hoyland, Barnsley, S74 9LH Classification: Bottle Manufacturers & Suppliers Status: Active Positional Accuracy: Automatically positioned to the address</p>	A14NE (E)	783	-	435737 401477
208	<p>Contemporary Trade Directory Entries</p> <p>Name: Birdwell Armoury Indoor Shooting Centre Location: 346, Sheffield Road, Birdwell, Barnsley, South Yorkshire, S70 5TU Classification: Gunsmiths Status: Inactive Positional Accuracy: Manually positioned to the address or location</p>	A8SW (S)	784	-	434774 400428

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
209	<p>Contemporary Trade Directory Entries</p> <p>Name: Monarch Indexing Location: Unit 2a, Shortwood Court, Shortwood Business Park, Hoyland, Barnsley, South Yorkshire, S74 9LH Classification: Print Finishers Status: Active Positional Accuracy: Automatically positioned to the address</p>	A14NE (E)	814	-	435771 401365
210	<p>Contemporary Trade Directory Entries</p> <p>Name: G B Truck Services Ltd Location: Cross Keys Works, Cross Keys Lane, Hoyland, Barnsley, South Yorkshire, S74 0QA Classification: Diesel Fuel Injection Services Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A9SW (SE)	867	-	435272 400542
210	<p>Contemporary Trade Directory Entries</p> <p>Name: S & H Recovery Services Ltd Location: Cross Keys Works, Cross Keys Lane, Hoyland, Barnsley, South Yorkshire, S74 0QA Classification: Breakdown and Recovery Status: Inactive Positional Accuracy: Manually positioned to the address or location</p>	A9SW (SE)	867	-	435272 400542
210	<p>Contemporary Trade Directory Entries</p> <p>Name: G B Truck Services Ltd Location: Cross Keys Works, Cross Keys Lane, Hoyland, Barnsley, South Yorkshire, S74 0QA Classification: Commercial Vehicle Bodybuilders & Repairers Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A9SW (SE)	867	-	435272 400542
210	<p>Contemporary Trade Directory Entries</p> <p>Name: G B Truck Service Ltd Location: Cross Keys Works, Cross Keys Lane, Hoyland, Barnsley, South Yorkshire, S74 0QA Classification: Commercial Vehicle Bodybuilders & Repairers Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A9SW (SE)	867	-	435272 400542
211	<p>Contemporary Trade Directory Entries</p> <p>Name: Prolyte Sales Location: Unit 1a, Shortwood Court, Shortwood Business Park, Hoyland, Barnsley, South Yorkshire, S74 9LH Classification: Aluminium Fabricators Status: Active Positional Accuracy: Automatically positioned to the address</p>	A15NW (E)	913	-	435870 401432
212	<p>Contemporary Trade Directory Entries</p> <p>Name: Direct Waste Services Location: Tinker La, Hoyland, Barnsley, South Yorkshire, S74 0PR Classification: Waste Disposal Services Status: Inactive Positional Accuracy: Manually positioned to the road within the address or location</p>	A9SE (SE)	981	-	435484 400524
213	<p>Fuel Station Entries</p> <p>Name: Mfg Hilltop Location: 1, Sheffield Road , Birdwell , Barnsley, South Yorkshire, S70 5XB Brand: Shell Premises Type: Petrol Station Status: Open Positional Accuracy: Manually positioned to the address or location</p>	A18SW (NW)	465	-	434478 401797
214	<p>Fuel Station Entries</p> <p>Name: Rockingham Roundabout Service Station Location: Dearne Valley Parkway , Birdwell , Barnsley, South Yorkshire, S70 5TW Brand: Bp Premises Type: Petrol Station Status: Open Positional Accuracy: Manually positioned within the geographical locality</p>	A8NE (SE)	620	-	435079 400723
215	<p>Fuel Station Entries</p> <p>Name: Lidgett Garage Location: A6135 , Hoyland Common , Barnsley, South Yorkshire, S74 0PB Brand: Unbranded Premises Type: Petrol Station Status: Non-Retail Positional Accuracy: Automatically positioned to the address</p>	A3NE (S)	960	-	435006 400301

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
216	Ancient Woodland Name: Short Wood Reference: 1103458 Area(m ²): 94053.61 Type: Ancient and Semi-Natural Woodland	A14NW (E)	331	8	435286 401446
217	Ancient Woodland Name: The Old Park Reference: 1103453 Area(m ²): 176563.54 Type: Plantation on Ancient Woodland	A12SE (SW)	475	8	434175 401062
218	Ancient Woodland Name: The Old Park Reference: 1103453 Area(m ²): 38225.39 Type: Ancient and Semi-Natural Woodland	A12SW (W)	544	8	434074 401150
219	Ancient Woodland Name: Not Supplied Reference: 1504799 Area(m ²): 55439.68 Type: Plantation on Ancient Woodland	A17SE (NW)	654	8	434179 401849
220	Ancient Woodland Name: Not Supplied Reference: 1411815 Area(m ²): 20207.62 Type: Ancient and Semi-Natural Woodland	A17SW (NW)	971	8	433813 401918
221	Ancient Woodland Name: Not Supplied Reference: 1411822 Area(m ²): 31244.12 Type: Ancient and Semi-Natural Woodland	A23SW (N)	977	8	434595 402413
222	Ancient Woodland Name: Wigfield Wood Reference: 1103454 Area(m ²): 13143.85 Type: Ancient and Semi-Natural Woodland	A17NE (NW)	979	8	434202 402241
223	Areas of Adopted Green Belt Authority: Barnsley Metropolitan Borough Council, Planning Department Plan Name: Barnsley Unitary Development Plan Status: Adopted Plan Date: 31st December 2000	A13SE (SE)	0	9	434809 401286
224	Areas of Unadopted Green Belt Authority: Barnsley Metropolitan Borough Council, Planning Department Plan Name: Barnsley Local Plan Status: Submission Draft Plan Date: 23rd December 2016	A19SE (E)	816	9	435727 401688
225	Nitrate Vulnerable Zones Name: River Dearne Nvz Description: Surface Water Source: Environment Agency, Head Office	A13NE (NE)	0	4	434780 401351

Agency & Hydrological	Version	Update Cycle
Contaminated Land Register Entries and Notices Rotherham Metropolitan Borough Council - Environmental Health Department Barnsley Metropolitan Borough Council - Environmental Health and Trading Standards Sheffield City Council - Environmental Protection Service	April 2014 July 2013 October 2017	Annual Rolling Update Annual Rolling Update Annual Rolling Update
Discharge Consents Environment Agency - North East Region	July 2019	Quarterly
Enforcement and Prohibition Notices Environment Agency - North East Region	March 2013	Annual Rolling Update
Integrated Pollution Controls Environment Agency - North East Region	October 2008	Variable
Integrated Pollution Prevention And Control Environment Agency - North East Region	July 2019	Quarterly
Local Authority Integrated Pollution Prevention And Control Barnsley Metropolitan Borough Council - Environmental Health and Trading Standards Sheffield City Council - Environmental Protection Service Rotherham Metropolitan Borough Council - Planning Department	April 2014 June 2014 October 2014	Variable Variable Variable
Local Authority Pollution Prevention and Controls Barnsley Metropolitan Borough Council - Environmental Health and Trading Standards Sheffield City Council - Environmental Protection Service Rotherham Metropolitan Borough Council - Planning Department	April 2014 June 2014 October 2014	Annual Rolling Update Annual Rolling Update Annual Rolling Update
Local Authority Pollution Prevention and Control Enforcements Barnsley Metropolitan Borough Council - Environmental Health and Trading Standards Sheffield City Council - Environmental Protection Service Rotherham Metropolitan Borough Council - Planning Department	April 2014 June 2014 October 2014	Variable Variable Variable
Nearest Surface Water Feature Ordnance Survey	September 2019	
Pollution Incidents to Controlled Waters Environment Agency - North East Region	December 1998	Not Applicable
Prosecutions Relating to Authorised Processes Environment Agency - North East Region	March 2013	Annual Rolling Update
Prosecutions Relating to Controlled Waters Environment Agency - North East Region	March 2013	Annual Rolling Update
Registered Radioactive Substances Environment Agency - North East Region	June 2016	
River Quality Environment Agency - Head Office	November 2001	Not Applicable
River Quality Biology Sampling Points Environment Agency - Head Office	July 2012	Annually
River Quality Chemistry Sampling Points Environment Agency - Head Office	July 2012	Annually
Substantiated Pollution Incident Register Environment Agency - North East Region - Ridings Area Environment Agency - North East Region - Yorkshire Area	July 2019 July 2019	Quarterly Quarterly
Water Abstractions Environment Agency - North East Region	July 2019	Quarterly
Water Industry Act Referrals Environment Agency - North East Region	October 2017	Quarterly
Groundwater Vulnerability Map Environment Agency - Head Office	June 2018	As notified
Bedrock Aquifer Designations Environment Agency - Head Office	January 2018	Annually

Agency & Hydrological	Version	Update Cycle
Superficial Aquifer Designations Environment Agency - Head Office	January 2018	Annually
Source Protection Zones Environment Agency - Head Office	October 2019	Quarterly
Extreme Flooding from Rivers or Sea without Defences Environment Agency - Head Office	August 2019	Quarterly
Flooding from Rivers or Sea without Defences Environment Agency - Head Office	August 2019	Quarterly
Areas Benefiting from Flood Defences Environment Agency - Head Office	August 2019	Quarterly
Flood Water Storage Areas Environment Agency - Head Office	August 2019	Quarterly
Flood Defences Environment Agency - Head Office	August 2019	Quarterly
OS Water Network Lines Ordnance Survey	July 2019	Quarterly
BGS Groundwater Flooding Susceptibility British Geological Survey - National Geoscience Information Service	May 2013	Annually
Waste	Version	Update Cycle
BGS Recorded Landfill Sites British Geological Survey - National Geoscience Information Service	June 1996	Not Applicable
Historical Landfill Sites Environment Agency - Head Office	October 2019	Quarterly
Integrated Pollution Control Registered Waste Sites Environment Agency - North East Region	October 2008	Not Applicable
Licensed Waste Management Facilities (Landfill Boundaries) Environment Agency - North East Region - Ridings Area Environment Agency - North East Region - Yorkshire Area	July 2018 July 2018	Quarterly Quarterly
Licensed Waste Management Facilities (Locations) Environment Agency - North East Region - Ridings Area Environment Agency - North East Region - Yorkshire Area	July 2019 July 2019	Quarterly Quarterly
Local Authority Landfill Coverage Barnsley Metropolitan Borough Council - Environmental Health and Trading Standards Rotherham Metropolitan Borough Council - Environmental Health Department Sheffield City Council - Environmental Protection Service	May 2000 May 2000 May 2000	Not Applicable Not Applicable Not Applicable
Local Authority Recorded Landfill Sites Barnsley Metropolitan Borough Council - Environmental Health and Trading Standards Rotherham Metropolitan Borough Council - Environmental Health Department Sheffield City Council - Environmental Protection Service	May 2000 May 2000 May 2000	Not Applicable Not Applicable Not Applicable
Registered Landfill Sites Environment Agency - North East Region - Ridings Area Environment Agency - North East Region - Yorkshire Area	March 2003 March 2003	Not Applicable Not Applicable
Registered Waste Transfer Sites Environment Agency - North East Region - Ridings Area Environment Agency - North East Region - Yorkshire Area	March 2003 March 2003	Not Applicable Not Applicable
Registered Waste Treatment or Disposal Sites Environment Agency - North East Region - Ridings Area Environment Agency - North East Region - Yorkshire Area	March 2003 March 2003	Not Applicable Not Applicable

Hazardous Substances	Version	Update Cycle
Control of Major Accident Hazards Sites (COMAH) Health and Safety Executive	April 2018	Bi-Annually
Explosive Sites Health and Safety Executive	March 2017	Annually
Notification of Installations Handling Hazardous Substances (NIHHS) Health and Safety Executive	November 2000	Not Applicable
Planning Hazardous Substance Enforcements Rotherham Metropolitan Borough Council Sheffield City Council Barnsley Metropolitan Borough Council - Planning Department	February 2016 February 2016 January 2016	Variable Variable Variable
Planning Hazardous Substance Consents Rotherham Metropolitan Borough Council Sheffield City Council Barnsley Metropolitan Borough Council - Planning Department	February 2016 February 2016 January 2016	Variable Variable Variable
Geological	Version	Update Cycle
BGS 1:625,000 Solid Geology British Geological Survey - National Geoscience Information Service	January 2009	Not Applicable
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	October 2019	Bi-Annually
CBSCB Compensation District Cheshire Brine Subsidence Compensation Board (CBSCB)	August 2011	Not Applicable
Coal Mining Affected Areas The Coal Authority - Property Searches	March 2014	Annual Rolling Update
Mining Instability Ove Arup & Partners	October 2000	Not Applicable
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	May 2015	Not Applicable
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Radon Potential - Radon Affected Areas British Geological Survey - National Geoscience Information Service	July 2011	Annually
Radon Potential - Radon Protection Measures British Geological Survey - National Geoscience Information Service	July 2011	Annually

Industrial Land Use	Version	Update Cycle
Contemporary Trade Directory Entries Thomson Directories	July 2019	Quarterly
Fuel Station Entries Catalist Ltd - Experian	September 2019	Quarterly
Gas Pipelines National Grid	July 2014	
Underground Electrical Cables National Grid	December 2015	
Sensitive Land Use	Version	Update Cycle
Ancient Woodland Natural England	August 2018	Bi-Annually
Areas of Adopted Green Belt Barnsley Metropolitan Borough Council - Planning Department Rotherham Metropolitan Borough Council Sheffield City Council	March 2019 March 2019 March 2019	As notified As notified As notified
Areas of Unadopted Green Belt Barnsley Metropolitan Borough Council - Planning Department Rotherham Metropolitan Borough Council Sheffield City Council	March 2019 March 2019 March 2019	As notified As notified As notified
Areas of Outstanding Natural Beauty Natural England	June 2019	Bi-Annually
Environmentally Sensitive Areas Natural England	January 2017	
Forest Parks Forestry Commission	April 1997	Not Applicable
Local Nature Reserves Natural England	March 2019	Bi-Annually
Marine Nature Reserves Natural England	July 2019	Bi-Annually
National Nature Reserves Natural England	July 2019	Bi-Annually
National Parks Natural England	April 2017	Bi-Annually
Nitrate Vulnerable Zones Environment Agency - Head Office Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	December 2017 October 2015	Bi-Annually
Ramsar Sites Natural England	April 2019	Bi-Annually
Sites of Special Scientific Interest Natural England	March 2019	Bi-Annually
Special Areas of Conservation Natural England	June 2019	Bi-Annually
Special Protection Areas Natural England	April 2019	Bi-Annually

A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	
Environment Agency	
Scottish Environment Protection Agency	
The Coal Authority	
British Geological Survey	 British Geological Survey <small>NATURAL ENVIRONMENT RESEARCH COUNCIL</small>
Centre for Ecology and Hydrology	 Centre for Ecology & Hydrology <small>NATURAL ENVIRONMENT RESEARCH COUNCIL</small>
Natural Resources Wales	
Scottish Natural Heritage	
Natural England	
Public Health England	
Ove Arup	
Peter Brett Associates	

Contact	Name and Address	Contact Details
1	British Geological Survey - Enquiry Service British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
2	Environment Agency - National Customer Contact Centre (NCCC) PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 03708 506 506 Email: enquiries@environment-agency.gov.uk
3	Barnsley Metropolitan Borough Council - Environmental Health and Trading Standards Central Offices, Kendray Street, Barnsley, South Yorkshire, S70 2TN	Telephone: 01226 770770 Fax: 01226 772599 Website: www.barnsley.gov.uk
4	Environment Agency - Head Office Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, Avon, BS32 4UD	Telephone: 01454 624400 Fax: 01454 624409
5	Ordnance Survey Adanac Drive, Southampton, Hampshire, SO16 0AS	Telephone: 03456 05 05 05 Email: customerservices@ordnancesurvey.co.uk Website: www.ordnancesurvey.gov.uk
6	Health and Safety Executive 5S.2 Redgrave Court, Merton Road, Bootle, L20 7HS	Website: www.hse.gov.uk
7	The Coal Authority - Property Searches 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG	Telephone: 0345 762 6848 Fax: 01623 637 338 Email: groundstability@coal.gov.uk Website: www2.groundstability.com
8	Natural England County Hall, Spetchley Road, Worcester, WR5 2NP	Telephone: 0300 060 3900 Email: enquiries@naturalengland.org.uk Website: www.naturalengland.org.uk
9	Barnsley Metropolitan Borough Council - Planning Department Central Offices, Kendray Street, Barnsley, South Yorkshire, S70 2TN	Telephone: 01226 770770 Fax: 01226 772599 Website: www.barnsley.gov.uk
-	Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards Chilton, Didcot, Oxfordshire, OX11 0RQ	Telephone: 01235 822622 Fax: 01235 833891 Email: radon@phe.gov.uk Website: www.ukradon.org
-	Landmark Information Group Limited Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk

Please note that the Environment Agency / Natural Resources Wales / SEPA have a charging policy in place for enquiries.



APPENDIX D

SUPPORTING DESK STUDY INFORMATION



British Geological Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL

BGS ID: 84439 : BGS Reference: SE30SE13
British National Grid (27700) : 435274,401100

[Report an issue with this borehole](#)

<< < Prev Page 1 of 5 Next > >>

SE 30 SE 13 30' 87 71
SECTION OF Rockingham Colliery at $\frac{1}{2}$ mile east of Burdwell

Maps: One-inch 87 Six-inch 282 NE County Yorkshire
Height above O.D. 425 ft. Latitude 53° 30' Longitude 1° 25' 6"
Communicated by 'Sec. Strata Yks. Clfld' 1927 p. 280 Date of Sinking Not stated
Made by _____ Dip of Strata 1 in 18 N 60° E

Summary of published record:		Thickness.			Depth from Surface.			
Intervening beds are shales, brinds, etc. with thin coal seams.	WESTPHALIAN B	Earth + clay	1.83	6	-	6	-	
		Swallow Wood Coal	0.93	3	1	20.93	68	8
		Stone	30.56	100	3	59.95	196	8
		Lidgett quarry	5.36	17	7	84.23	276	4
		Lidgett Coal (with dirt)	1.24	4	1	88.47	290	3
		Joan Coal	0.46	1	6	127.92	419	8
		Tankersley Ironstone	2.34	7	8	145.08	476	-
		Flockton Thick Coal (with dirt)	1.98	6	6	154.23	506	-
		Flockton Thin Coal (with mid-dirt)	1.14	3	7	181.79	596	5
		High Fenton " (with dirt)	1.42	4	8	206.12	676	3
Low " " (with dirt)	1.35	4	5	209.25	686	6		
CARBONIFEROUS	WESTPHALIAN A	<u>Parkgate Coal</u> (with dirt)	3.43	11	3	227.63	746	10
		Rock	8.61	28	3	251.28	824	5
		Thorncliffe Thin Coal (with dirt)	3.05	10	-	257.48	844	9
		Claywood Ironstone	1.98	6	6	298.30	978	8
SILURIAN	SCAM	<u>Silkstone Coal</u> (with dirt)	1.56	5	1 1/2	309.96	1016	11
		Rock	2.39	7	10	312.93	1026	8

Totals given in published record for coal at 978'8"
Silkstone + bottom of shaft are incorrect
fide Colliery Surveyor (file J.V. Stephens)
This mistake is due to misprint in
No. 122 Blue bind 0.0.6". This should be 6.0.0".

N.B. Drawn up section from sections of Strata (1950 Edition) correct, C.A. 10/11/78.
British Geological Survey

British Geological Survey

H. Johnson
14.6 71



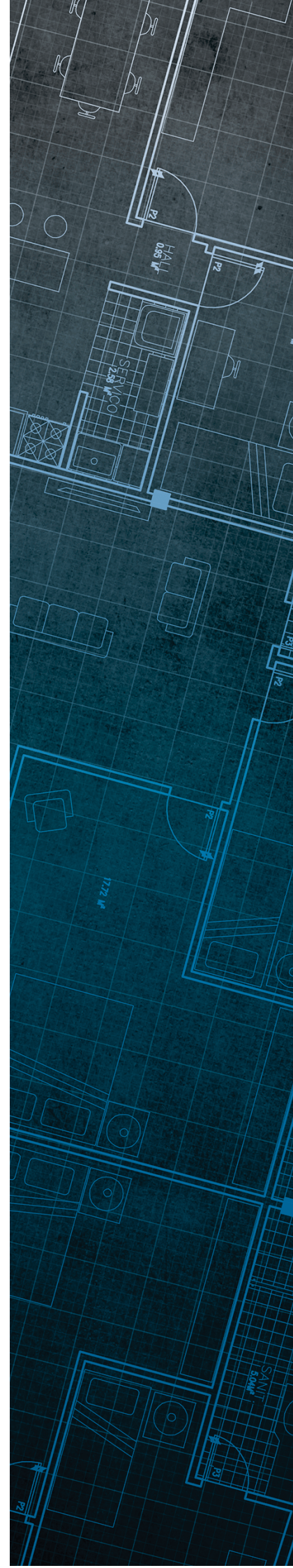
The Coal
Authority

Consultants Coal Mining Report

Hay Green Lane
Birdwell
Barnsley
S70 5XD

Date of enquiry: 6 November 2019
Date enquiry received: 6 November 2019
Issue date: 6 November 2019

Our reference: 51002188370001
Your reference: 350283



Consultants

Coal Mining Report

This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

Laura Alderman

Enquiry address

Hay Green Lane
Birdwell
Barnsley
S70 5XD

How to contact us

0345 762 6848 (UK)
+44 (0)1623 637 000 (International)

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

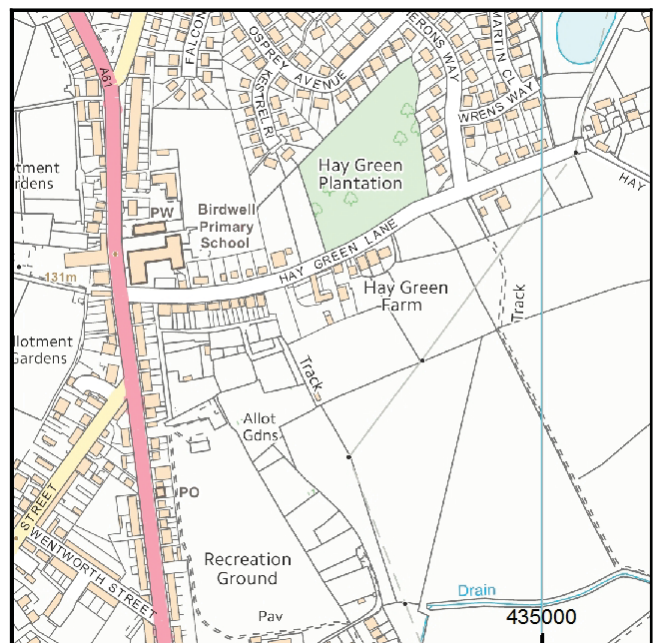
www.groundstability.com

 @coalauthority

 /company/the-coal-authority

 /thecoalauthority

 /thecoalauthority



Approximate position of property



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Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
unnamed	LIDGETT	Coal	6IGC	55	Beneath Property	6.7	North-East	66	1914
ROCKINGHAM	FLOCKTON THICK	Coal	6IGI	126	Beneath Property	4.1	North-East	102	1951
ROCKINGHAM	FLOCKTON THICK	Coal	6IGH	144	Beneath Property	2.8	North-East	173	1953
ROCKINGHAM	FLOCKTON THICK	Coal	6IGK	144	North-West	4.4	North-East	178	1954
unnamed	TOP FENTON	Coal	6IGO	172	Beneath Property	4.1	North-East	104	1935
ROCKINGHAM	LOW FENTON	Coal	6IGS	175	Beneath Property	4.5	North-East	124	1979
WHARNCLIFFE	PARKGATE	Coal	6IGY	192	Beneath Property	4.9	North-East	147	1890
unnamed	TOP FENTON	Coal	6IGP	197	North-West	4.0	North-East	106	1933
unnamed	PARKGATE	Coal	6IGZ	217	North-West	4.1	North-East	129	1896
unnamed	MIDDLETON MAIN	Coal	6IH4	222	Beneath Property	4.6	North-East	94	1918
unnamed	SILKSTONE	Coal	6IHB	270	Beneath Property	4.7	North-East	147	1899
unnamed	SILKSTONE	Coal	6ICH	294	North-West	4.1	North-East	147	1914
unnamed	WHINMOOR	Coal	64RY	324	South	3.8	East	91	1941
unnamed	WHINMOOR	Coal	6IHE	327	Beneath Property	3.7	North-East	68	1944

Probable unrecorded shallow workings

Yes.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Shaft	434401-002	434565 401394		Coal	

Abandoned mine plan catalogue numbers

The following abandoned mine plan catalogue numbers intersect with some, or all, of the enquiry boundary:

SY173	NE852	17828
NE855	SY207	NE853
NE1075	7183	SY171

Our records show we have more plans than those shown above which could affect the enquiry boundary.

Please contact us on 0345 762 6848 to determine the exact abandoned mine plans you require based on your needs.

Outcrops

Seam name	Mineral	Seam workable	Distance to outcrop (m)	Direction to outcrop	Bearing of outcrop
SWALLOW WOOD	Coal	Yes	Within	N/A	317

Geological faults, fissures and breaklines

Please refer to the 'Summary of findings' map (on separate sheet) for details of any geological faults, fissures or breaklines either within or intersecting the enquiry boundary.

Fault under or close to the property recorded.

Opencast mines

Please refer to the "Summary of findings" map (on separate sheet) for details of any opencast areas within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

Site investigations

None recorded within 50 metres of the enquiry boundary.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

Coal mining subsidence

There are 2 claim(s) within 50 metres of the property boundary that do not match the property address. These are shown on the enquiry boundary plot.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

If further subsidence damage claims information is required, please visit www.groundstability.com.

See Section 4 for further information.

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining

None recorded.

Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

Court orders

None recorded.

Section 46 notices

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

Withdrawal of support notices

The property is in an area where notices to withdraw support were given in 1946, 1950 and 1951.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

Payments to owners of former copyhold land

The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Section 4 – Further information

The following potential risks have been identified and as part of your risk assessment should be investigated further.

Development advice

The site is within an area of historical coal mining activity. Should you require advice and/or support on understanding the mining legacy, its risks to your development or what next steps you need to take, please contact us.

Coal mining subsidence

The site is within an area of previous interest. It is close to where the Coal Authority or licensed mine operator has investigated and where necessary remediated issues relating to coal mining subsidence.

The site requires further investigation and may influence your risk assessment. We recommend that you order the appropriate **Coal Authority Subsidence Claims Report**, which will include more information about the hazard.

For further information on specific site or ground investigations in relation to any issues raised in Section 4, please call us on 0345 762 6848 or email us at groundstability@coal.gov.uk.

Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk**.

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

Opencast mines

Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips

Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations

Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites

Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence

Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas

Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission.

Mine water treatment schemes

Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining

Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing

Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders

Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices

Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

Withdrawal of support notices

Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

Payment to owners of former copyhold land

Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

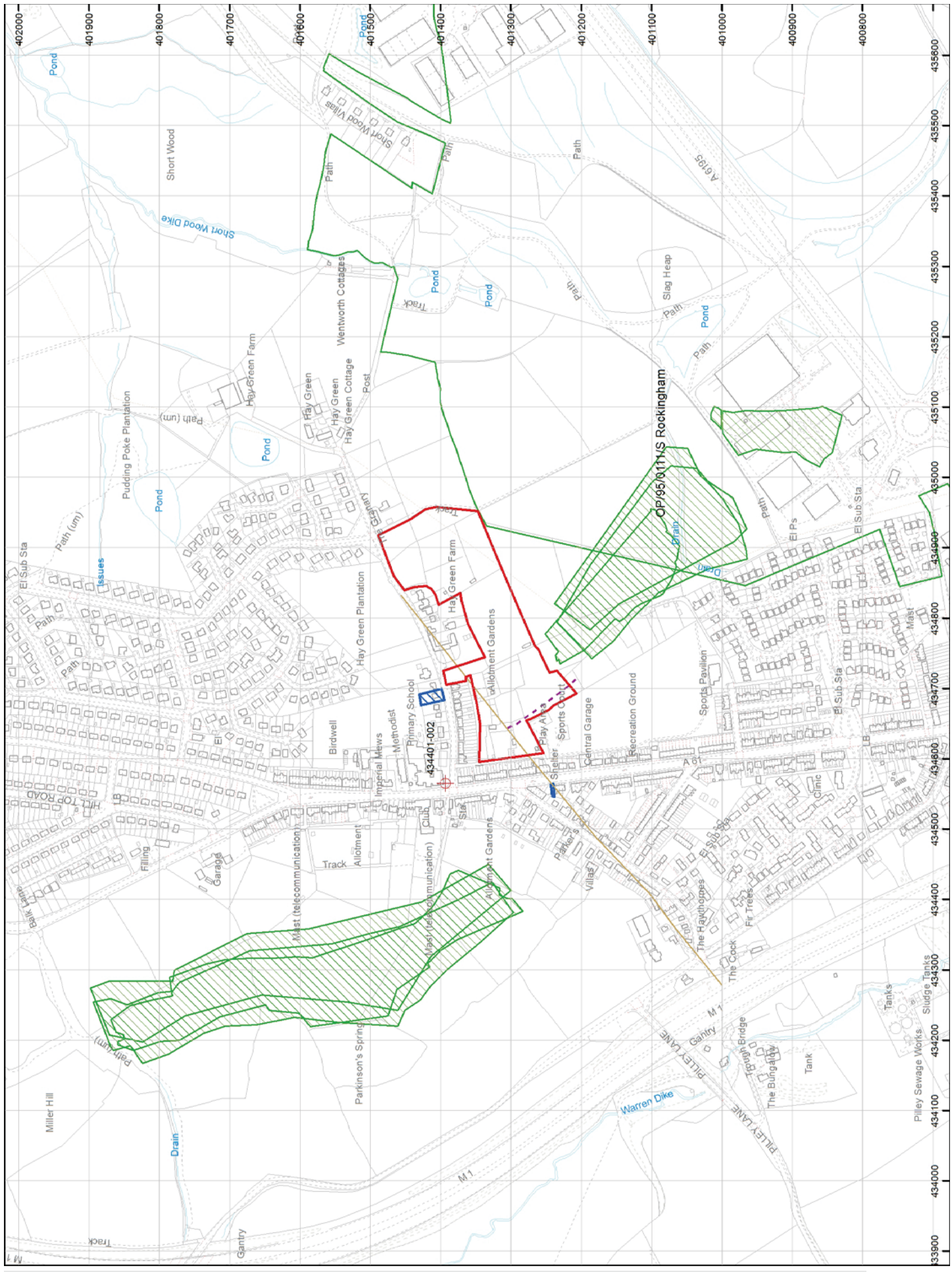
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VAT receipt

Issued by	The Coal Authority 200 Lichfield Lane Mansfield Nottinghamshire NG18 4RG
Tax point date	06 November 2019
Issued to	LAURA ALDERMAN RSK POTTERY STREET CASTLEFORD WAKEFIELD WF10 1NJ
Property search for	HAY GREEN LANE BIRDWELL BARNESLEY S70 5XD
Reference number	51002188370001
Date of issue	06 November 2019
Cost	£112.13
VAT @ 20%	£22.43
Total received	£134.56
VAT registration	598 5850 68

Summary of findings

The map highlights any specific surface or subsurface features within or near to the boundary of the site.



Key

- Approximate position of the enquiry boundary shown
- Disused mine shaft
- Outcrop (Conjectured)
- Geological faults
- Opencast mine licence area
- Unlicensed opencast site
- Coal claim



APPENDIX E

UTILITY SERVICE PLANS

Utilities Report

This report is issued for the site described as:

Site off Hay Green Lane, Birdwell

Report Reference:

222269253_1

National Grid Reference:

434790,401350

Customer Reference:

LM / 80473

Report Date:

28 October 2019

CONTACT DETAILS





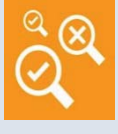
 If you require any assistance please contact our customer services team on:

0844 844 9966




 or by email at:

helpdesk@landmark.co.uk

Utility Type

	Electricity	AFFECTED
	Gas	AFFECTED
	Water and Sewerage	AFFECTED
	Telecoms	AFFECTED
	Other	AFFECTED

Report Information

	Works Description: Legal Conveyancing
	This is Batch A - Responses Enclosed
	Awaiting Further Responses

Utilities Report



Understanding This Report

We have asked a comprehensive list of Utility companies whether they have any apparatus or underground services in the vicinity of the site.

Location Map

This shows the plan that was dispatched to the Utility companies. The companies have been asked to return information on the area outlined, which will encompass your chosen site.

Request Status Report

This will confirm the current status of the information requests. We list which responses we have received and whether the company is affected. The Status Report will be divided into the following sections.

Affected Utilities - We have received plans/information

No response received - We are still awaiting a full response

Not affected utilities - We have received a not affected/no plant present response

Responses

Affected responses are listed by company.

Any responses from companies confirming they are not affected are provided at the back of the report for your records.



'Awaiting Further Responses' or 'Pack Complete'?

We do not include Local Authority requests when indicating if the pack is 'Complete' or 'Awaiting Further Responses' as Local Authorities are not obliged to reply to these enquiries.

The local authority for the area is contacted to see if they have any council owned property that may be affected by works. In general, these plant enquiries go to the highways department for responses regarding street lighting and drainage. However, the responses we receive can vary each time depending on resources available at the council and we often don't receive replies from local authorities at all.

Response Times

We endeavour to obtain as much of the information as possible within the timescale of this report. Unfortunately, there are occasions when the response times of the utility companies mean we do not receive all information within the chosen timescale.

In these scenarios we will send all the information that is available as a first report. When we receive any remaining responses, the report will be re-issued in full incorporating the new information. This will continue until the report is complete. The front page of the report will confirm the batch (e.g. A, B or C) and whether responses are outstanding.

Terms and Conditions

Full Terms and Conditions can be found on the following link: <http://www.landmarkinfo.co.uk/Terms/Show/515>

Please note that Utility reports have a validity of 3 months from the date of purchase.

If you experience difficulties accessing our Terms and Conditions, please copy and paste the link directly into your browser, you will then be able to access our Terms and Conditions from there. Should you still experience difficulties, please telephone our Customer Service Team on 0844 844 9966.

Next Steps:

For any queries regarding the report content, or help with the report, contact your Landmark Customer Services team.

Utilities Report



Landmark Utilities Report Service PAS 128 Statement

Prepared for: **Landmark Information Group Ltd**

Practitioner: Atkins

Order Number: 80473

Site Name: Site off Hay Green Lane, Birdwell

Date of Order: 22 October 2019

Date of Issue: 28 October 2019

Thank you for using our Utility Report Service.

This report has been completed in accordance with the standards defined under Survey Category D of PAS128, a Publicly Available Specification for underground utility detection, verification and location published by the British Standards Institution.

Positional accuracy of plant is not guaranteed from information presented in a desktop search alone and the location of underground utilities should be verified through other means prior to breaking ground.

Information relating to the presence of Radio Frequency Identification Devices (RFIDs) has been requested from relevant utility companies or taken from mapping systems where available.

Utility companies who have not responded to enquiries are referenced on the enclosed Status Report accordingly. Their response will be chased and forwarded on for a period of up to four working weeks. Whilst we cannot guarantee that a utility company will respond to our enquiries, we endeavour to obtain responses from those that have not responded.

Any responses contained within this report have been obtained between the start date of the order and the date of issue.

If you want to discuss your report further with us please contact Landmark Customer Services.

Utilities Report

Our Reference:	LM / 80473	Checked by:	RKRS
Site Name:	Site off Hay Green Lane, Birdwell	Site size (ha):	10.87

Overview of Site



Map Scale:	1:5000
Defining Coordinates (& postcodes)	1: E: 434785, N: 401348, 2: E: 435012, N: 401401, 3: E: 434924, N: 401545, 4: E: 434546, N: 401353, 5: E: 434692, N: 401153 (S70 5XQ, S70 5XD, S70 5SQ, S70 5UX, S70 5TA)

Note: Please ensure the entire area within the red boundary on this plan is covered.

Site off Hay Green Lane, Birdwell

S70 5XA

OSGR: 434790,401350

Date Requested: 22 October 2019

Client Reference:

222269253_1

Affected Utilities We have received plans/information from the following companies. Please see the enclosed response.

Utility	Category	Date Issued	Late Response Issue Date	Notes
Cadent Gas Ltd	Gas	28 October 2019		
CityFibre	Telecom	28 October 2019		
Instalcom - [CenturyLink, Global Crossing, Fibernet & Fiberspan]	Telecom	28 October 2019		
LinesearchbeforeUdig	Other	28 October 2019		Zayo Group UK Ltd c/o JSM Group Ltd - identified as affected. See separate response.
Northern Powergrid	Electric	28 October 2019		
Openreach - [British Telecommunications]	Telecom	28 October 2019		
Utility Assets	Electric	28 October 2019		See response.
Virgin Media	Telecom	28 October 2019		
Vodafone	Telecom	28 October 2019		Only affected sent.
Yorkshire Water	Water, Sewerage	28 October 2019		
Zayo Group UK Ltd c/o JSM Group Ltd	Telecom	28 October 2019		Additional information to follow.

No Response Received We are still awaiting a full response from the following companies.

Utility	Category	Date Issued	Late Response Issue Date	Notes
Barnsley Metropolitan Borough Council	Council			
C.A. Telecom UK - [Colt Technology Services]	Telecom			

Not Affected Utilities We have received a not affected/no plant present response from the following companies.

Utility	Category	Date Issued	Late Response Issue Date	Notes
Energetics	Gas, Electric	28 October 2019		
Environment Agency	Environmental Agency	28 October 2019		
GTC	Telecom, Gas, Electric, Water	28 October 2019		
Network Rail	Rail	28 October 2019		
SKY Telecommunications Services	Telecom	28 October 2019		
SSE	Telecom, Gas, Electric, Water, Sewerage, Steam	28 October 2019		
Verizon	Telecom	28 October 2019		

Checked and Validated By LE



Date 28 October 2019

Definition of Terms

Affected - Utility supplier is expected to be affected by any work carried out in the area searched as their records indicate their plant is in or close to the area searched. It is recommended to anybody carrying out works in the area that they should consult with the utility company as soon as possible and in any event prior to carrying out any works.

No Response Received - At the date of sending the report no response has been received from the utility supplier.

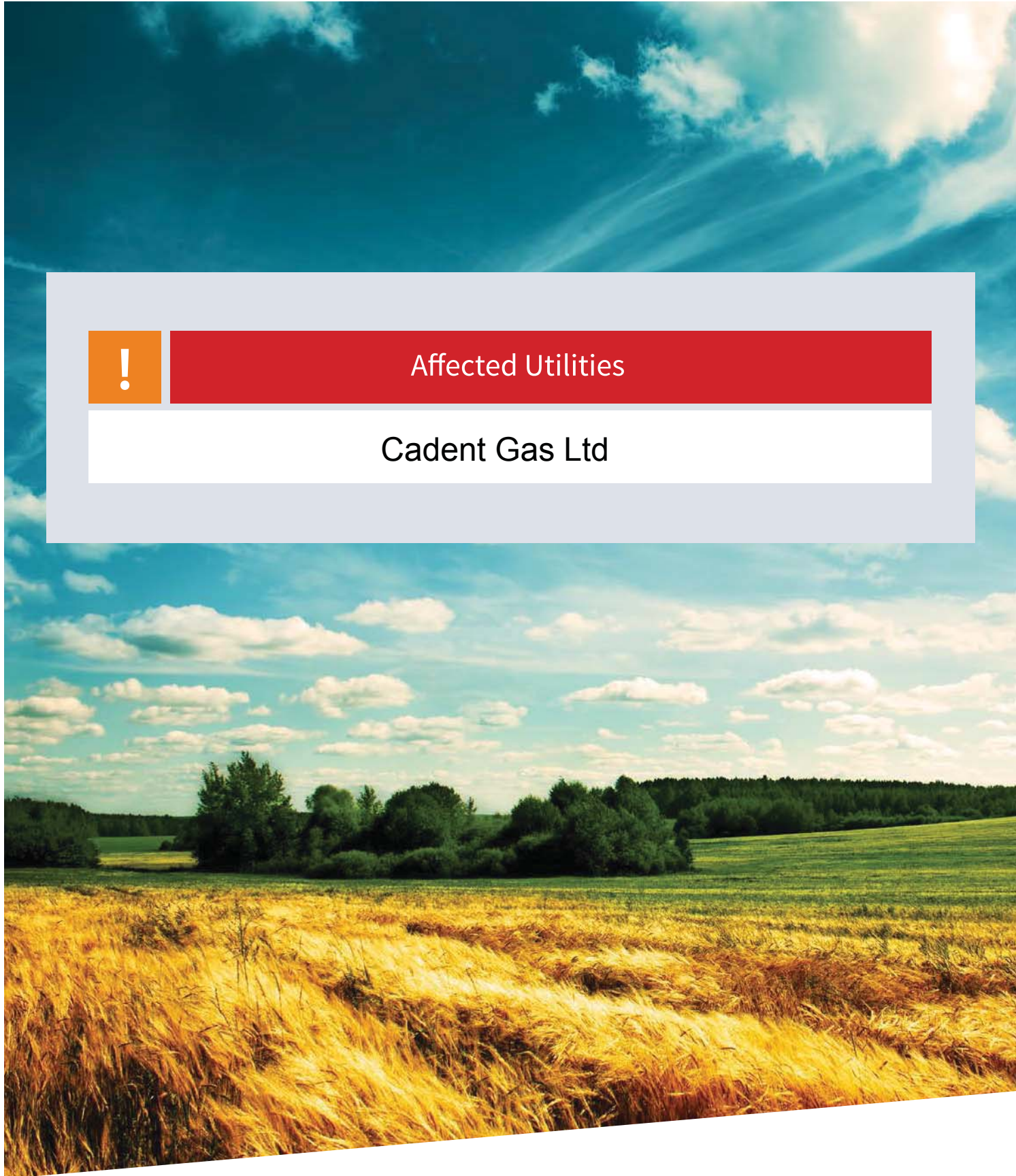
Not Affected - Utility supplier is not expected to be affected by any work carried out in the area searched as their records indicate their plant is not in or close to the area searched.

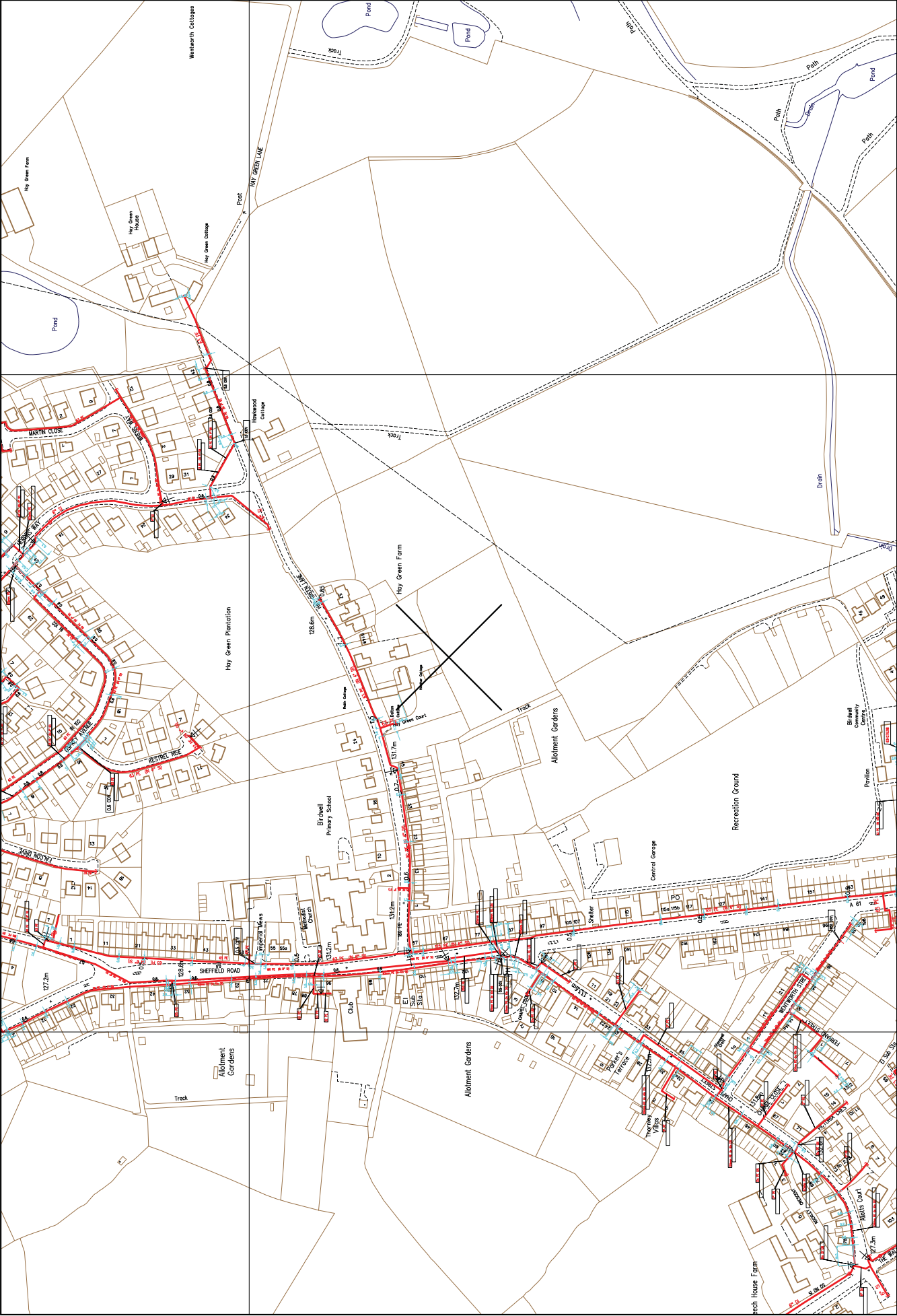
Utilities Report



Affected Utilities

Cadent Gas Ltd





SCALE: Not to scale
 USER ID: MLOH2099
 DATE: 23/10/2019
 EXTRACT DATE: 10/06/2019
 MAP REF: SE3401
 CENTRE: 434785, 401348

Some examples of Pipe Data:
 Value
 Depth of Cover
 Syphon
 Discharge
 Material Change

LP MAINS
 MP MAINS
 P MAINS
 LPP MAINS
 NFP MAINS

This plan shows those pipes owned by National Grid Gas plc in their role as a Licensed Gas Transporter (GT). Gas pipes owned by other GTs, or otherwise privately owned, may be present in this area. Information with regard to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections, etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by National Grid Gas plc or their agents, servants or contractors for any error or omission. Safe digging practices, in accordance with HSG47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue. Further information on all DRAs can be determined by calling the DR4 hotline on 01455 892426 (9am-5pm) A DR4 is where a potential error has been identified within the asset record and a process is currently underway to investigate and resolve the error as appropriate.

MAPS Viewer Version 5.6.7.0
 Local Machine
 This plan is reproduced from or based on the OS map by National Grid Gas plc, with the sanction of the controller of HM Stationery Office.
 Crown Copyright Reserved.

Utilities Report



Affected Utilities

CityFibre



M, Lohith

From: online.plantenquiries@cityfibre.com
Sent: 23 October 2019 16:58
To: Utility Solutions GDC Requests
Subject: CityFibre Plant Enquiry, issued on 10/23/19 12:27 PM. Reference 7c0k1hnm1m7pwwx.
Attachments: emap.pdf
Follow Up Flag: Follow up
Flag Status: Flagged

You recently requested information pertaining to the above location and in relation to CityFibre Holdings Ltd plant.

Reference 7c0k1hnm1m7pwwx
User: OYScelliott
Title: 80473
Comment:

Please find attached a plan of the area of your interest that may contain plant which may be affected by your proposed works.

The validity of this response is 6 weeks, after such time a new enquiry would need to be made.

Please see the points of contact below if they are required:

Plant Enquiries
Rutherford House
Birchwood Park
Warrington
WA3 6ZH
asset.team@cityfibre.com

Please quote the Reference ID in the subject line in any correspondence.

Please be aware that all information included in this eMap is the property of the sender and subject to copyright. It is illegal to copy or send this information to any third party without the permission of the sender.

LEGEND

- EXISTING PLANT
- EXISTING PLANT

© Crown copyright 2015
Licence No. OS 0100031673

Select a btimep

Head Office
CityFibre Holdings Ltd
15 Bedford Street,
Warrington,
WC2E 9HE
Tel: 0845 293 0774
Web: www.cityfibre.com

Asset Office
CityFibre Holdings Ltd,
Rutherford House,
Warrington,
WA3 6ZH
Email: asset.team@cityfibre.com

Disclaimer:

Information shown on this plan is for general guidance only. No warranty is made as to its accuracy. This plan must not be solely relied upon in the event of excavation or other works being carried out in the vicinity of CityFibre plant. No liability of any kind is accepted by CityFibre, its agents or servants for any error, omission, discrepancy or reversal. This information is valid for the date printed.

Project

Plant Enquiry

Drawing

Existing Plant

Drawn by:

smallworld

Date: 23/10/2019

Drawing No.

CFH_EP_000001

Revision

001

Scale: 1:1250

A4



0m 100m 200m



Utilities Report



Affected Utilities

Instalcom □ CenturyLink, Global Crossing, Fibernet □ Fiberspan □



CHECKED

From: Plantenquiries <Plantenquiries@instalcom.co.uk>
Sent: 22 October 2019 20:38
To: Utility Solutions GDC Requests
Subject: E10-19-5253 RE: Urgent Plant Enquiry - 80473 - Site off Hay Green Lane, Birdwell - Please respond by 25/10/2019
Attachments: 80473 - Site off Hay Green Lane, Birdwell.pdf; Guide To Excavation.pdf

Dear Sir or Madam,

With reference to your enquiry regarding the above noted location, we enclose the drawing(s) indicating the approximate position of services in this area.

We would draw your attention to the fact that while the position of the plant has been shown as accurately as possible, the information is intended as a general guide only and must not be relied upon in the event of any excavations or other work in the vicinity. **We would remind you that the onus remains on you to determine the exact position for example by a hand excavated trial hole.** Instalcom accepts no liability for claims arising from any inaccuracy, omissions or errors contained herein. If you would like to query the location further, please email us accordingly and we can arrange an in depth survey, which will be charged at a cost. Enclosed is a guide to excavation works around existing plant.

Instalcom responds to plant enquiries for CenturyLink Communications UK Limited (formerly Level 3), GLOBAL CROSSING (UK) LTD, GLOBAL CROSSING PEC and FIBERNET UK LTD and FIBRESPAN LTD simultaneously and therefore you only need send one copy of a plant enquiry to cover all of these companies.

Please note that this response is only valid for 3 months. If your works do not commence within this time period, please resubmit your plant enquiry for assessment before any works commence.

If you require any further information, please do not hesitate to contact us.

Regards

Plant Enquiries Dept
Instalcom Limited
Borehamwood Ind. Park
Rowley Lane
Borehamwood
WD6 5PZ

Office: +44 (0)208 731 4613
Fax: +44 (0)208 731 4601
Email: plantenquiries@instalcom.co.uk
Web: <http://www.instalcom.co.uk>





From: Utility Solutions GDC Requests [mailto:requests.utilitysolutions@atkinglobal.com]
Sent: 22 October 2019 12:49
To: online@barnsley.gov.uk; plantenquiries@catelecomuk.com; plantenquiries@lastmile-uk.com; 'Environment agn' <enquiries@environment-agency.gov.uk>; Plantenquiries <Plantenquiries@instalcom.co.uk>; opburiedservicesenquiries@networkrail.co.uk; nrswa@sky.uk; assetrecords@utilityassets.co.uk; osp-team@uk.verizon.com; National Plant Enquiries <OSM.enquiries@atkinglobal.com>
Subject: Urgent Plant Enquiry - 80473 - Site off Hay Green Lane, Birdwell - Please respond by 25/10/2019
Importance: High



Our Reference: 0473
 Site Name: Site off Hay Green Lane, Birdwell
 Works Description: Development Appraisal
 Site Grid References: 43461 401349,434962 401403,434596 401346,434923 401495,434692 401203

To whom it may concern,

Please find enclosed a plant enquiry for your attention.



Within your response please quote our reference number and the name of the site shown above. If you do not have any apparatus in this area, please could you send written confirmation to declare that no apparatus is affected. Please also include information relating to the use and location of Radio Frequency Identification Devices (RFIDs) where available.

our prompt response will assist with our clients proposals in your interests of plant protection.

If you have any queries in relation to this plant enquiry please do not hesitate to contact us.

Kind regards,




N

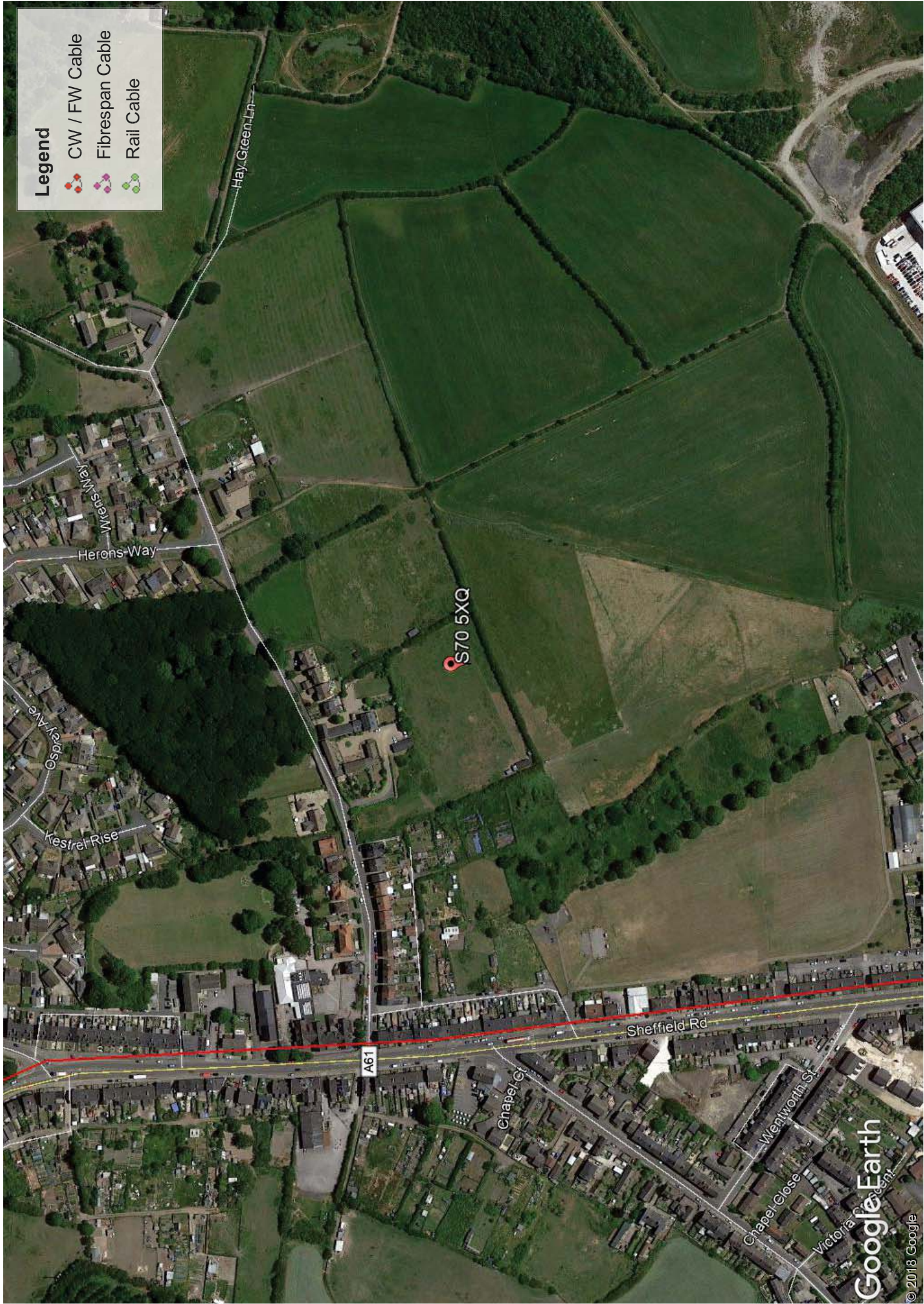
The Hub, 500 Park Avenue, Atec West, Almondsbury, Bristol, BS32 4RZ.

Tel: 4401454 66206

Email: requests.utilitysolutions@atkinglobal.com

Legend

-  CW / FW Cable
-  Fibrespan Cable
-  Rail Cable



SPECIAL REQUIREMENTS IN RELATION TO CENTURYLINK PLANT

1. In this special requirement, the following terms shall have the meanings assigned to it:
 - a. "Company" means CenturyLink.
 - b. "Company Representative" means the staff of CenturyLink or its Authorized Representatives and Agents.
 - c. "Apparatus" means all surface or sub-surface equipment and plant including any associated cabling and/or ducting owned leased or rented by CenturyLink.
2. Before commencing any work or moving heavy plant or equipment over any portion of the site, the contractor shall confirm details of the Apparatus, owned, leased or rented by the Company, within the site with the Company Representative, who can be contacted at the following point:

Instalcom Limited
Borehamwood Industrial Park
Rowley Lane
Borehamwood
Hertfordshire
WD6 5PZ
Tel: 0208 731 4600
Fax: 0208 731 4601
E-mail: plantenquiries@instalcom.co.uk

3. Where such details show that the works or the movement of plant or equipment may endanger the Apparatus of the Company the Contractor must give the Company Representative at least 7 days written notice of the date on which it is intended to commence such works of the movement of plant and equipment in order that the presence of any sub-surface apparatus can be indicated by markers to be supplied by the Company and placed by the Contractor under the supervision of a Company Representative. The Contractor shall ensure that all Company Apparatus, particularly surface running cabling is adequately protected from damage and such protective measures shall be approved by the Company Representative.
4. In the event of a Company marker being disturbed for any reason, it shall not be replaced other than in the exact position of its former depth unless the repositioning is carried out at the direction and under the supervision of a Company Representative.
5. The Contractor shall take particular care in relation to the protection of Company Apparatus, where such Apparatus includes the presence within the site of optical fibre cabling. The contractor should particularly note that the damage to such Apparatus is extremely disruptive to the Company network and costly to reinstate. The Contractor shall make every effort to avoid the disturbance of Company Apparatus more than is absolutely necessary for the completion of the works in accordance with the contract.

6. When excavating around, moving or backfilling around Company Apparatus, the Company Representative shall be given adequate notice, which shall not be less than 3 days, of the contractor's intentions in order that he may supervise the works. The Contractor should note that the normal depth of cover for Company Apparatus and ducts are as follows: □

- a. Carriageways 600mm
- b. Footways 350mm
- c. Bridges 450mm

These minimum depths of cover should be maintained wherever possible.

Where the minimum depths of cover cannot be maintained, the Contractor shall carry out the instructions of the Company Representative for the protection of Company Apparatus.

Where cables are not in duct and the required depth of cover cannot be maintained, such cables as are affected shall be enclosed and protected in PVC duct or equivalent materials as supplied by the Company and by the method directed by the Company Representative.

With regard to excavation in the vicinity of Company Apparatus the Contractor should have particular regard to the possibility of reduced cover and the encountering of such Company Apparatus at depths of cover less than that given at □□□□□□□□□□□□.

7. All excavation adjacent to Company Apparatus is to be carried out by hand until the exact extent and/or location of Company Apparatus is known. Mechanical borers and/or excavators shall not be used within 1.0m of Company Apparatus without the supervisory presence of a Company Representative, to prevent any movement of Company Apparatus during excavations, complete shuttering shall be used as directed by the Company Representative if: □

- a. Excavation is deeper than the depth of cover of adjacent Company Apparatus.
- b. Excavation is within 1.0m of Company Apparatus in stable ground.
- c. Excavation is within 5.0m of Company Apparatus in unstable ground.

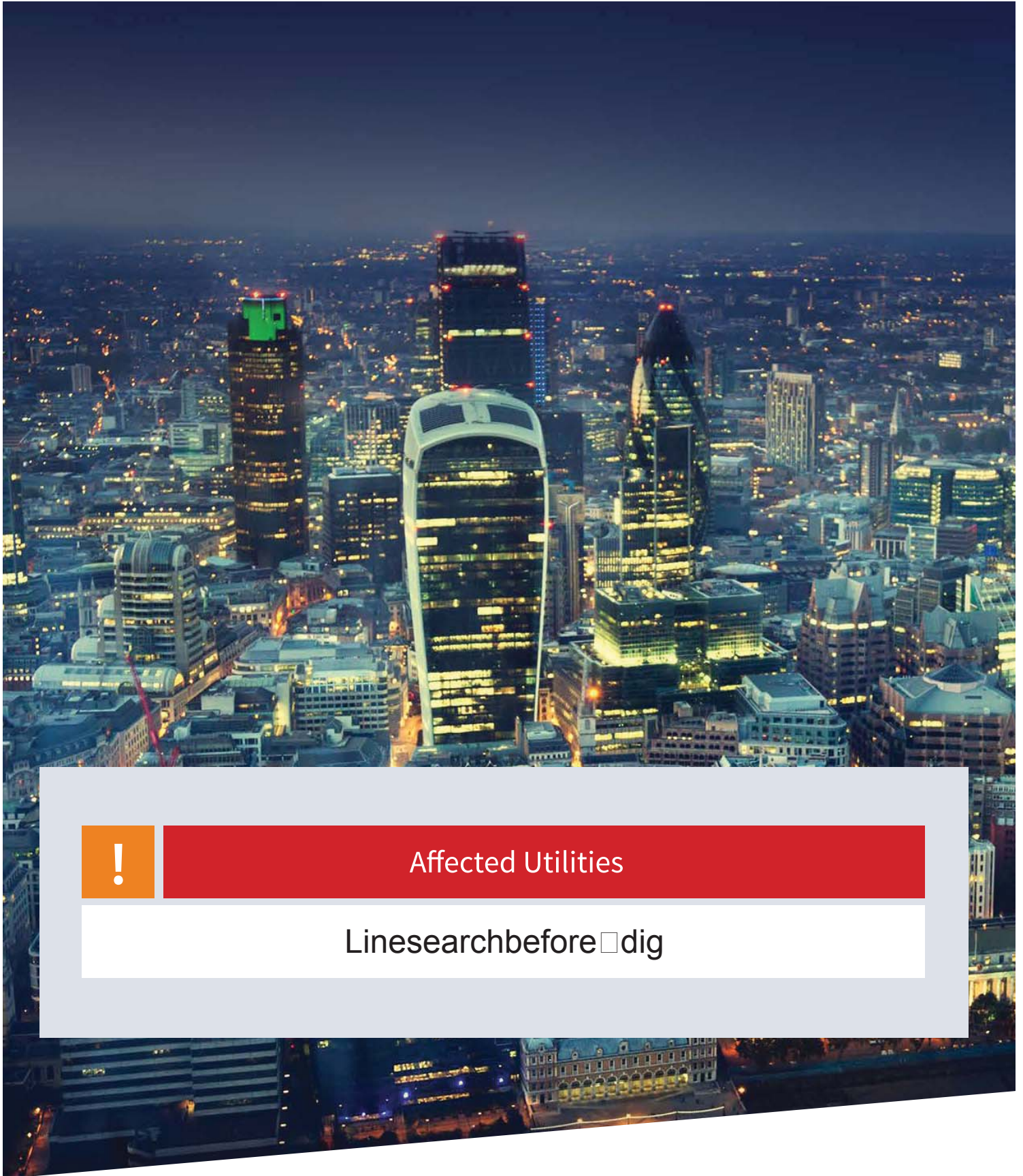
If for the completion of the works, the Contractor intends using any of the following: □

- a. Pile driving equipment within 10.0m of Company Apparatus.
- b. Explosives within 20.0m of Company Apparatus.
- c. Laser equipment within 10.0m of Company Apparatus.

The Contractor shall advise the Company Representative, giving at least 7 working days written notice in order that any special protective measure for the Company Apparatus affected may be arranged.

8. All Company manhole, joint box and /or other access points and chambers within the site shall be kept clear and unobstructed. Access for vehicles, winches, cable drums and/or further equipment required by the Company for the maintenance of its Apparatus, must be maintained at all reasonable times. The Contractor should particularly note that footway type jointing chambers are not specified for carriageway loadings and will need to be adequately protected and/or demolished and rebuilt under the supervision of a Company Representative where such chambers are likely to be placed at risk, either temporarily or permanently, from the movement of plant and/or equipment on the site.

Utilities Report



Affected Utilities

Linesearchbefore dig

Enquirer

Name	Ms Christina Elliott	Phone	01454 662397
Company	Atkins	Mobile	Not Supplied
Address	500 Park Avenue Aztec West Almondsbury Bristol BS32 4RZ		
Email	stat.enquiries@atkinglobal.com		

Enquiry Details

Scheme/Reference	LM 80473/AT		
Enquiry type	Initial Enquiry	Work category	Utility Works
Start date	25/10/2019	Work type	Single excavation site
End date	25/01/2020	Site size	120817 metres square
Searched location	XY= 434790, 401350	Work type buffer*	25 metres
Confirmed location	434781 401356		
Site Contact Name	Not Supplied	Site Phone No	Not Supplied
Description of Works	Not Supplied		

* The WORK TYPE BUFFER is a distance added to your search area based on the Work type you have chosen.

Site Map



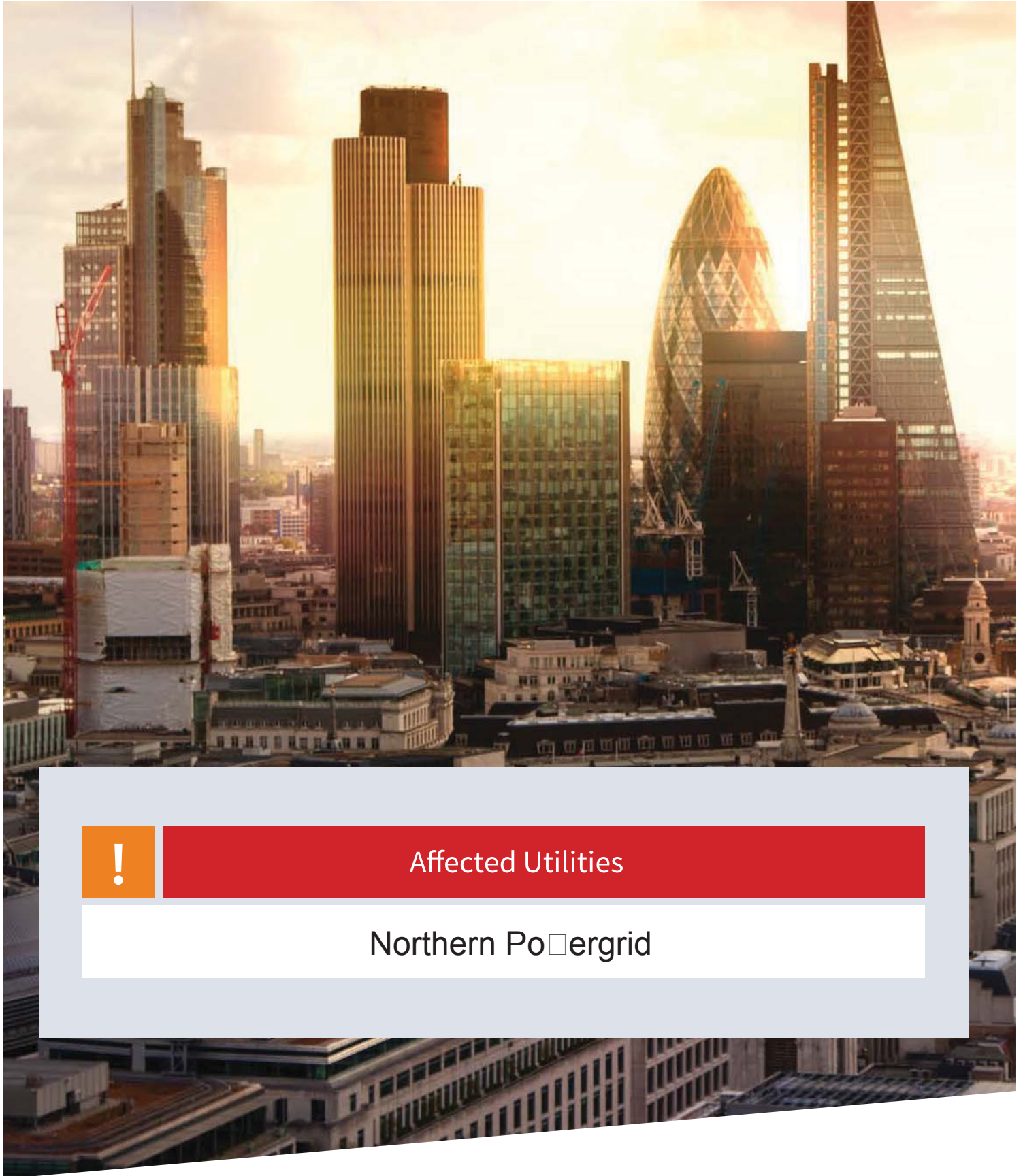
LSBUD enquiries are processed in the order they are received. LSBUD enquiries are processed on a first come first served basis.

List of active LSBUD enquiries			
Enquiry Name	Enquiry Ref	Enquiry No	Status
Zayo Group UK Ltd c/o SM Group Ltd	01992 655 919	0800 169 1646	Await response

LSBUD enquiries are processed in the order they are received. LSBUD enquiries are processed on a first come first served basis.

List of active LSBUD enquiries		
AWE Pipeline	Balfour Beatty Investments Limited	BIC Limited (A Member of the Linde Group)
BP Exploration (operating) Company Limited	BPA	Carrington Gas Pipeline
CATS Pipeline c/o Wood Group PSN	Cemex	Centrica Storage Ltd
CL Pipeline System Ltd	CNG Services Ltd	Concept Solutions People Ltd
ConocoPhillips (UK) Ltd	UK (M) Abandoned Pipelines	Crax Group
E.ON UK COP Limited	EirGrid	Electricity North West Limited
ENI (Imor) c/o Penspen Ltd	Enquest NNS Limited	EP Langage Limited
ESP Utilities Group	ESSAR	Esso Petroleum Company Limited
Fulcrum Pipelines Limited	Gamma	Gateshead Energy Company
Igniclear Ltd	Grid	Gasfren (yfrd)
Leathro Airport LT	Gumbly Grove Energy	Gas Energy
INEOS IPS Pipelines	INEOS Manufacturing (Scotland and TSEP)	INTEYN Enterprises Limited
Intergen (Coryton Energy or Spalding Energy)	Mainline Pipelines Limited	Manchester (etline) Limited
Manx Cable Company	Marchwood Power Ltd (Gas Pipeline)	Melbourn Solar Limited
Murphy Utility Assets	National Grid Gas (Above 7 bar), National Grid Gas Distribution Limited (Above 2 bar) and National Grid Electricity Transmission	Northumbrian Water Group
NPower COP Pipelines	Nikos Storage Limited	Orsted
Perenco UK Limited (Purbeck Southampton Pipeline)	Perenco UK Limited (Purbeck Southampton Pipeline)	Petroineos
Phillips 66	Premier Transmission Ltd (SNIP)	Prysmian Cables & Systems Ltd (c/o Western Link)
Redundant Pipelines (LP)A	RWE Great Yarmouth Pipeline (Bacton to Great Yarmouth Power Station)	RWEnpower (Little Barford and Southaven)
SABIC UK Petrochemicals	Scottish and Southern Electricity Networks	Scottish Power Generation
Seabank Power Ltd	SES Water	Severn Trent (Chester area only)
SIN	Shell (St Ergus to Mossmorran)	Shell Pipelines
SSE (Peterhead Power Station)	SSE Enterprise Telecoms	Tata Communications (c/o SM Construction Ltd)
Total (Colnbrook & Colwick Pipelines)	Total (In)line Pipelines	Transmission Capital
UK Power Networks	Uniper UK Ltd	Wattenfall
Veolia ES SELCO P Limited	Veolia ES Sheffield Ltd	Wales and West Utilities

Utilities Report



Affected Utilities

Northern Powergrid



Date: 24/10/2019

Mr Evans
The Hub, 500 Park Avenue, Aztec West,
Bristol
BS32 4RZ

Tel: 0191 229 4294
Northern Powergrid Records Information Centre
New York Road
Shiremoor
Newcastle Upon Tyne
NE27 0LP

Dear Mr Evans

Enquiry No: SD104769
Scheme Reference: 80473

Thank you for using Northern Powergrid's online Safedig service for your planned works.

Your plan has been generated using our most up to date information. Due to the nature of the information we hold and how often works on the network are carried out, we can only guarantee this plan at the time of generation. We will do our best to notify you if we update the information in your indicated area, but you should endeavour to obtain an up to date plan whenever you commence your works.

The map that has been provided to you will show all the relevant Northern Powergrid electricity cables that are in your indicated dig site, we have included some of the surrounding area as well in case your dig extends further than you previously thought. At any point you may re-apply for your plan to increase the indicated area using the previously submitted details. This plan will be valid for 30 days from the point at which it became available to you.

The enclosed mains records only give the approximate location of known Northern Powergrid apparatus in the area. Great care is therefore needed and all cables and overhead lines must be assumed to be live.

Please note that while all efforts are made to ensure the accuracy of the data, no guarantee can be given. We would refer you to the Health & Safety Executive's publication HS(G)47 "Avoiding Danger From Underground Services" which emphasises that:

- Plans must only be used as a guide in the location of underground cables. The use of a suitable cable-tracing device is essential and careful hand digging of trial holes must be carried out to positively identify and mark the exact route of the cable. You should also bear in mind that a cable is unmistakably located only when it has been safely exposed.
- Cable depths are not generally indicated on our records and can vary considerably even when shown.
- Great caution must be exercised at all times when using mechanical plant. Careful trial digging should always be carried out on the whole route of the planned excavation to ascertain if cables exist.

The Health & Safety executive have another publication, GS6 "Avoidance of Danger from Overhead Electric Lines" that you should be aware of if your work is near overhead powerlines. Both of these documents provide comprehensive guidance for observance of statutory duties under the Electricity at Work Regulations 1989 and the Health & Safety at Work Act 1974. Our provision of these records is based upon the assumption that people using them will have sufficient competence to interpret the information given. Any damage or injury caused will be the responsibility of the organization concerned who will be charged for any repairs.

Please note ground cover must not be altered either above our cables or below overhead lines, in addition no trees should be planted within 3 metres of existing underground cables or 10 metres of overheadlines. All our apparatus is legally covered by a wayleaves agreement, lease or deed or alternatively protected under

the Electricity Act 1989. Should any alteration/diversion of our Company's apparatus be necessary to allow your work to be carried out, budget costs can be provided by writing to Network Connections, Alix House, Falcon Court, Stockton On Tees, TS18 3TU.

Tel:0800 0113433

Yours faithfully,

Safedig Team
Northern Powergrid

NORTHERNPOWERGRID

is the trading name of Northern Powergrid(Northeast) limited(RegisteredNo:2906593) and Northern Powergrid(Yorkshire) pic(Registered No:4112320) Registered Office: lloydsCourt, 78 Grey Street, Newcastle upon Tyne NE1 6AF.Registered in England and Wales.



Assume all Northern Powergrid assets are live, unless proved otherwise

Please establish the on-site position of Northern Powergrid assets prior to the commencement of site works

For specialist assistance or enquiries, please use one of the following options:

General enquiries- 0800 011 3332

- Option 1 -Electricity emergency or power cut
- Option 2- Electricity bill enquiries
- Option 3- New connection, disconnection, meter enquiry, increased load, service alteration
- Option 4- Request for Safedig Plans
- Option 5- Other general enquiries; including request for site visit, safe working heights

Public safety emergency line -(0800 151 3255)

- Reports of exposed underground cables, grounded overhead conductors etc.

Network connections or diversions - 0800 011 3433

- Maximum load enquiries, connection quotation

Wayleave enquiries- Northeast (0191 229 4604) or Yorkshire (01977 605 104)

- Queries relating to ownership of assets, wayleave agreements

If site works are to be performed more than 3 months after you have received safe dig plans from Northern Powergrid, it is advisable that you request a more up to date copy.

Call Centre Phone Numbers: If the area is located in: North East call 0800 668877, Yorkshire or North Lincs call 0800 375675.

Northern Powergrid Holdings Company

The position of our equipment is shown on the plan as accurately as possible, it may have changed since the plan was produced. Therefore the position of our equipment and those services which may not be shown should be established on site. Electricity cables not owned by Northern Powergrid Holdings Company may be laid in this area and may not be shown on this plan. Where private cables are shown, the information should not be regarded as accurate and should be used for guidance purposes only. In all cases, accurate information should be obtained from the owner of such cables prior to the commencement of work on site.

Reference should be made to HSE Guidance, HS(G)47 'Avoiding Danger from Underground Services' and GS6 'Avoidance of Danger from Overhead Power Lines'.

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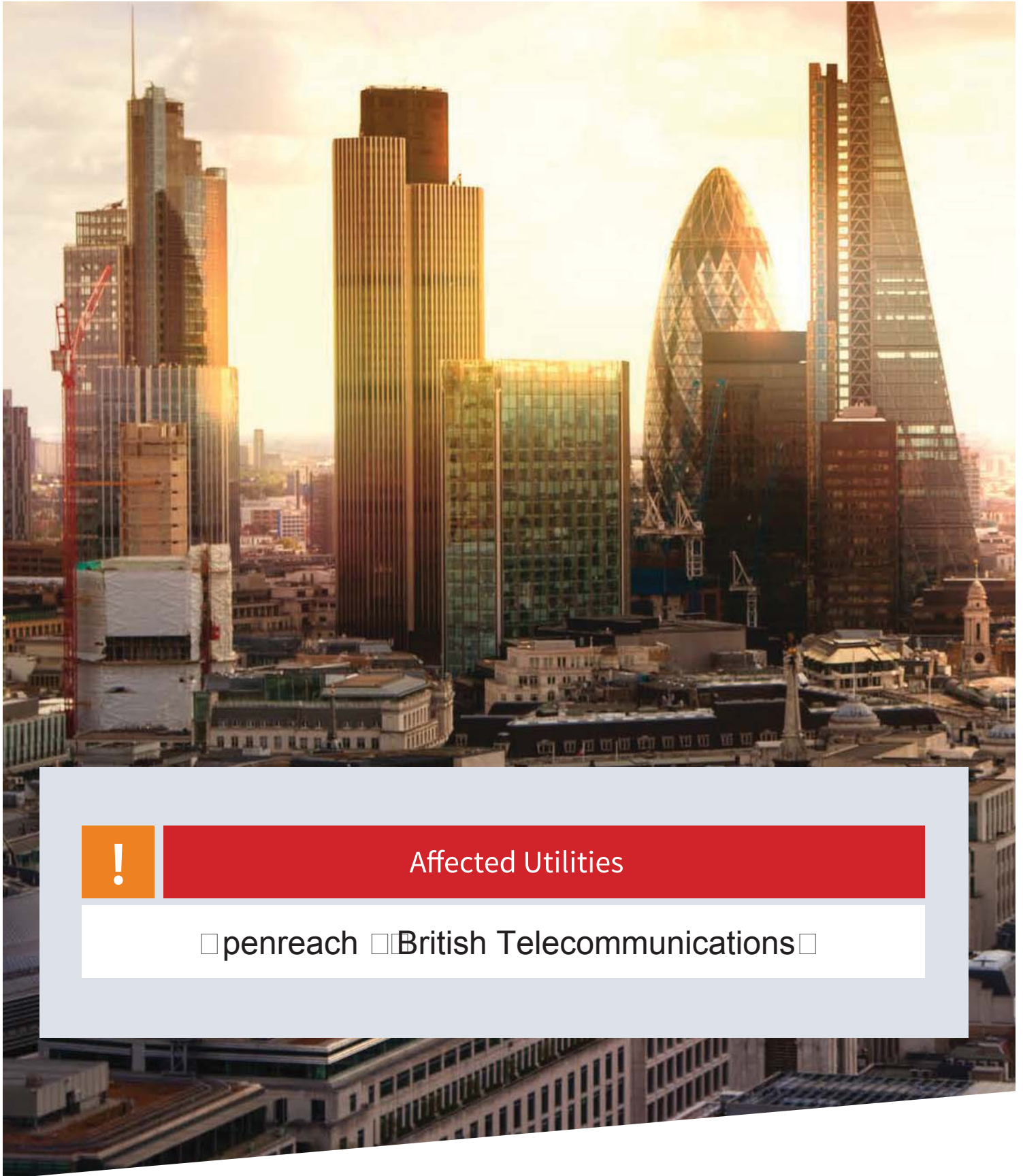
Legend:

	132kV		20kV		LV Mains
	66kV		11kV		LV Service
	33kV		6kV		LV Service Assumed Route
	25kV		3kV		LV Service Logical Connection
	Left In Situ		Aux		
Overhead Conductors:					
	132kV		20kV		LV Mains
	66kV		11kV		LV Service
	33kV		6kV		Aux
	25kV				

Date Printed:

Scale: 1:

Utilities Report



Affected Utilities

penreach British Telecommunications

CHECKED

openreach

Our Ref: Ref shown on map

Date of issue: shown on map

email: nnhc@openreach.co.uk

Dear Customer,

NR & SW ACT 1991 – PROPOSED WORKS AT: **SITE LOCATION**

Prior to commencement of work: For free onsite guidance and accurate up to date location of BT Apparatus please contact our Plant Protection Service by the following methods:-

Email the Click Before You Dig Team CBYD@openreach.co.uk

Visit the Click Before You Dig Website www.openreach.co.uk/cbyd

Thank you for your request of **/**/** describing the above proposals.

Enclosed are copies of our drawings marked up to show the approximate locations of BT apparatus in the immediate vicinity of your works. It is intended for general guidance only. No guarantee is given of its accuracy.

The drawings are valid for 90 days from the date of issue and should not be relied upon after this time period has expired.

When planning excavation work or other works near to BT apparatus, please be mindful our apparatus may exist at various depths and may deviate from the marked route.

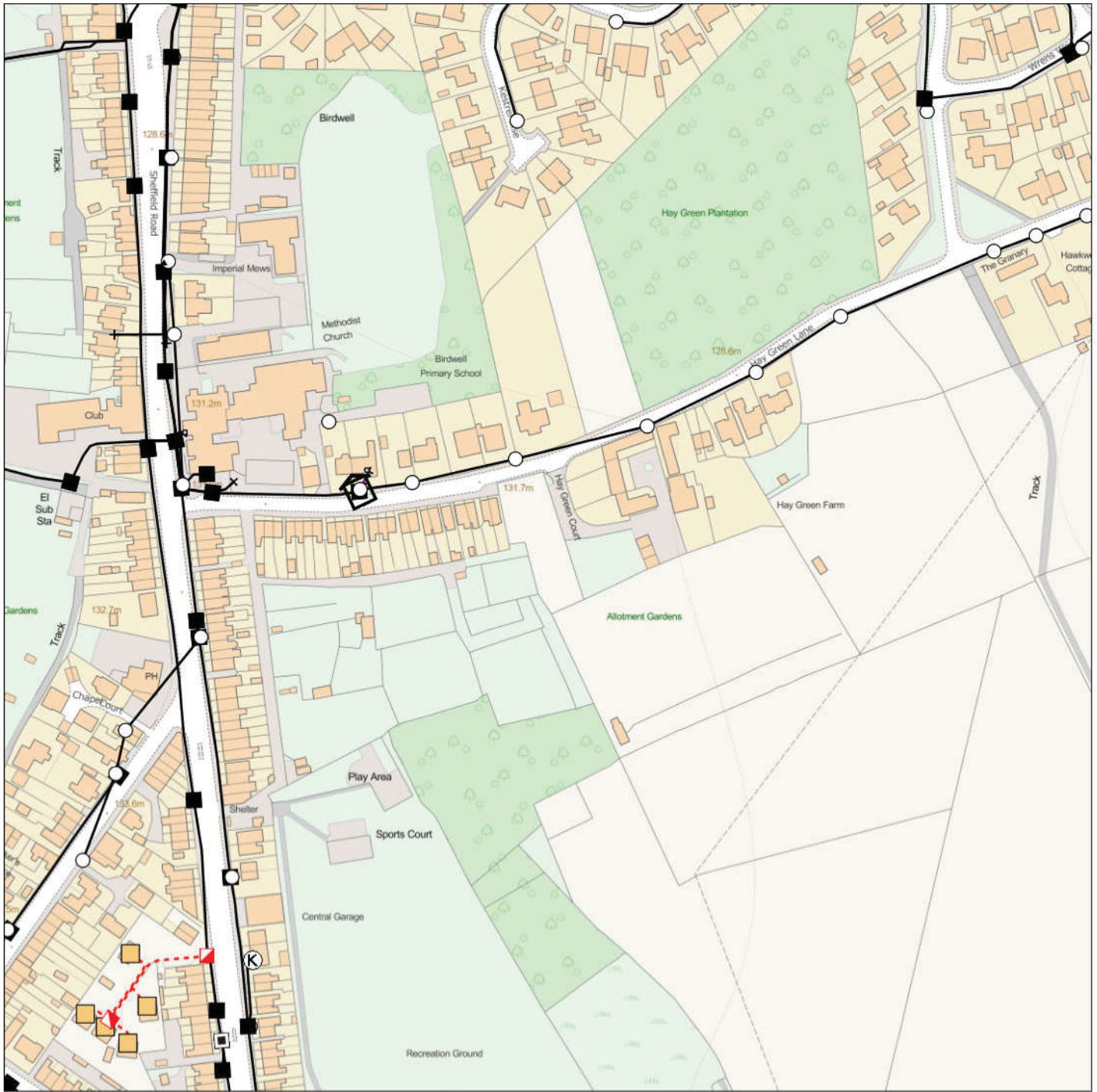
To avoid damage it is recommended that mechanical excavators or borers are not used within 600mm of BT apparatus. If scaffolding is erected, please ensure that our equipment is not enclosed, blocked, covered or otherwise obstructed by the scaffolding.

In the event of BT apparatus being in the area of your works we recommend that your plant/vehicle crossing is either resited, or apply for a budget estimate by submitting detailed plans to our Network Relocation Team at <https://www.ournetwork.openreach.co.uk/altering-our-network.aspx>

Yours faithfully,

Jason Carrington
NNHC & MBE Manager

Maps by email Plant Information Reply



IMPORTANT WARNING

Information regarding the location of BT apparatus is given for your assistance and is intended for general guidance only. No guarantee is given of its accuracy. It should not be relied upon in the event of excavations or other works being made near to BT apparatus which may exist at various depths and may deviate from the marked route.



openreach

CLICK BEFORE YOU DIG

FOR PROFESSIONAL FREE ON SITE ASSISTANCE PRIOR TO COMMENCEMENT OF EXCAVATION WORKS INCLUDING LOCATE AND MARKING SERVICE

email cbyd@openreach.co.uk

ADVANCE NOTICE REQUIRED

(Office hours: Monday - Friday 08.00 to 17.00)

www.openreach.co.uk/cbyd

Accidents happen

If you do damage any Openreach equipment please let us know by calling 0800 023 2023 (opt 1 + opt 1) and we can get it fixed ASAP

KEY TO BT SYMBOLS

		Change Of State	+	Hatchings	
	<i>Planned</i>	<i>Live</i>	×	Built	
PCP			▲	Planned	
Pole			■	Inferred	
Box			Ⓚ	Duct	
Manhole			Other proposed plant is shown using dashed lines. BT Symbols not listed above may be disregarded.		
Cabinet			Existing BT Plant may not be recorded. Information valid at time of preparation. Maps are only valid for 90 days after the date of publication.		
	<i>Pending Add</i>	<i>In Place</i>	<i>Pending Remove</i>	<i>Not In Use</i>	
Power Cable					
Power Duct				N/A	

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BT Ref : KNA06132K

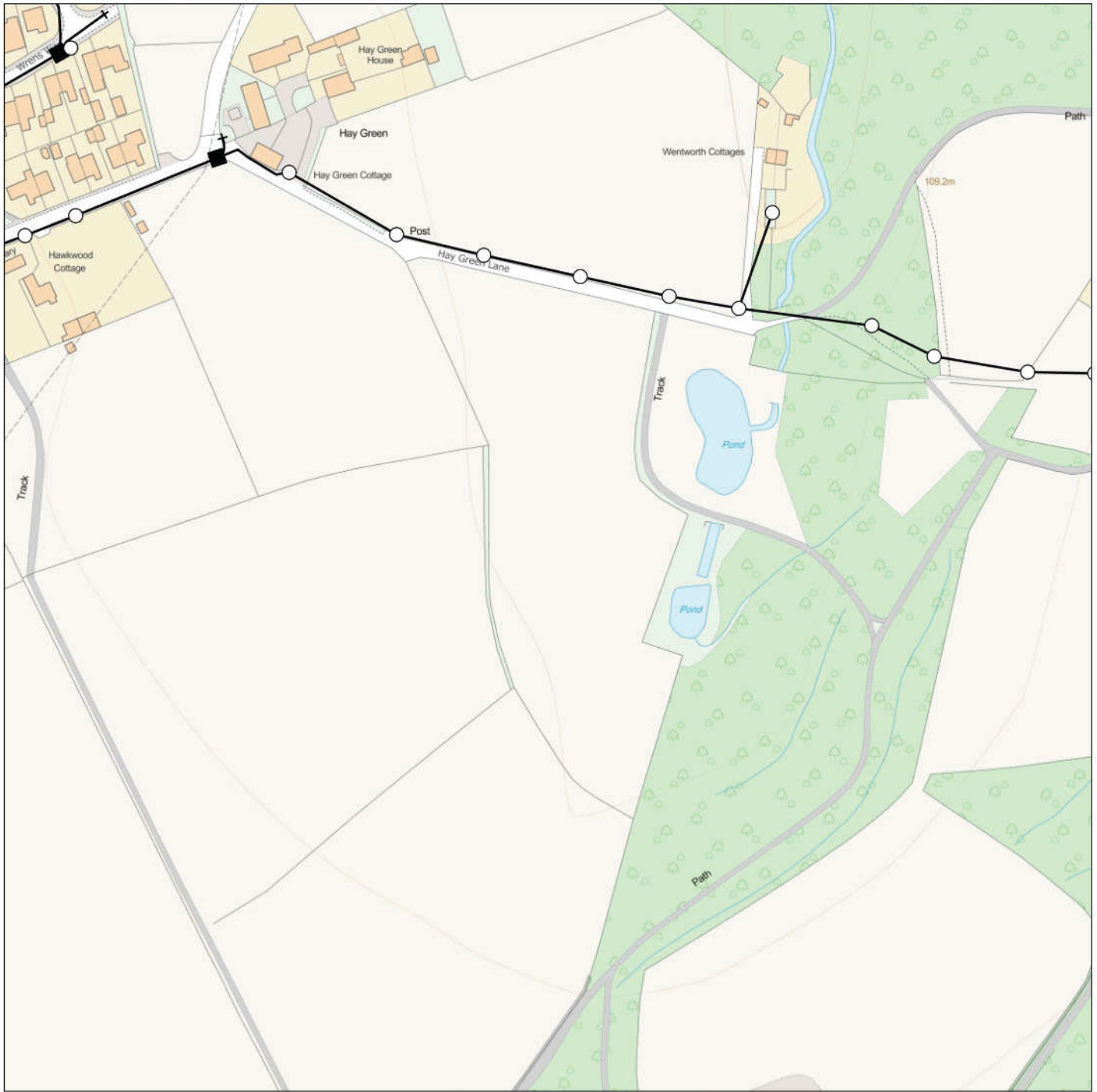
Map Reference : (centre) SE3472801362

Easting/Northing : (centre) 434728,401362

Issued : 23/10/2019 06:13:26

WARNING: IF PLANNED WORKS FALL INSIDE HATCHED AREA IT IS ESSENTIAL BEFORE PROCEEDING THAT YOU CONTACT THE NATIONAL NOTICE HANDLING CENTRE. PLEASE SEND E-MAIL TO: nnhc@openreach.co.uk

Maps by email Plant Information Reply



IMPORTANT WARNING

Information regarding the location of BT apparatus is given for your assistance and is intended for general guidance only. No guarantee is given of its accuracy. It should not be relied upon in the event of excavations or other works being made near to BT apparatus which may exist at various depths and may deviate from the marked route.



openreach

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FOR PROFESSIONAL FREE ON SITE ASSISTANCE PRIOR TO COMMENCEMENT OF EXCAVATION WORKS INCLUDING LOCATE AND MARKING SERVICE

email cbyd@openreach.co.uk

ADVANCE NOTICE REQUIRED

(Office hours: Monday - Friday 08.00 to 17.00)

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Accidents happen

If you do damage any Openreach equipment please let us know by calling 0800 023 2023 (opt 1 + opt 1) and we can get it fixed ASAP

KEY TO BT SYMBOLS

	<i>Planned</i>	<i>Live</i>	Change Of State	+	Hatchings	
			Split Coupling	×	Built	
PCP			Duct Tee	▲	Planned	
Pole			Building	■	Inferred	
Box			Kiosk	Ⓚ	Duct	
Manhole			Other proposed plant is shown using dashed lines. BT Symbols not listed above may be disregarded. Existing BT Plant may not be recorded. Information valid at time of preparation. Maps are only valid for 90 days after the date of publication.			
Cabinet						
	<i>Pending Add</i>	<i>In Place</i>	<i>Pending Remove</i>	<i>Not In Use</i>		
Power Cable						
Power Duct				N/A		

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BT Ref : OZY06139F

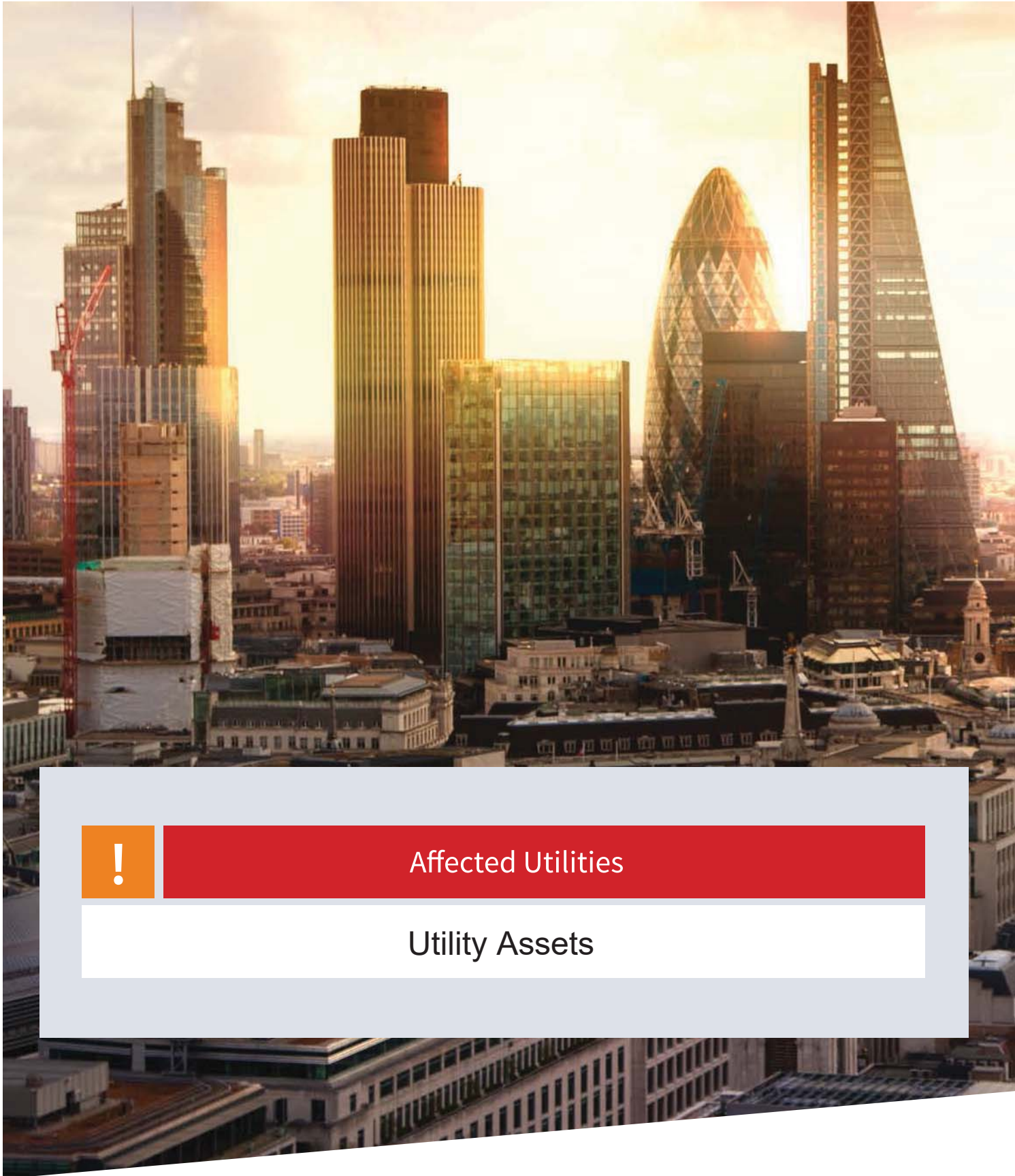
Map Reference : (centre) SE35 19301362

Easting/Northing : (centre) 435 193,401362

Issued : 23/10/2019 06:13:26

WARNING: IF PLANNED WORKS FALL INSIDE HATCHED AREA IT IS ESSENTIAL BEFORE PROCEEDING THAT YOU CONTACT THE NATIONAL NOTICE HANDLING CENTRE. PLEASE SEND E-MAIL TO: nnhc@openreach.co.uk

Utilities Report



Affected Utilities

Utility Assets

DISR

SUR UD: Utility Assets

On 22/10/2019, an enquiry was sent to Utility Assets plant record department. As of the date of issue of this Utilities Report, we have not received a formal response from Utility Assets in regards to opening any equipment on this site. Utility Assets have however advised the following:

"Thank you for recently contacting Utility Assets plant record department. We will check whether we have any plant present at your site and contact you within 5 - 7 working days ONLY if we own any plant in the vicinity.

If we do not reply, we do not have any apparatus in the area of your works. However, PLEASE TAKE CARE when excavating around electricity cables in the event that not all cables present may be accurately shown. We recommend you use detecting equipment to map the site before excavating and fully comply with HSG47. DO NOT assume that a cable is dead if you don't have a record of its presence. The cable must be treated as live unless PROVEN DEAD by the cable owner. In case of emergency please contact your local electricity distribution company.

This is an automated reply from our dedicated asset records email address. If you receive further correspondence from us it will be from asset.manager@utilityassets.co.uk quoting a site reference number.

Asset Manager - Utility Assets Ltd"

If a formal response is received within 3 months of the date of this search it will be forwarded onto you as per our usual service. However, without formal communication from Utility Assets it remains unconfirmed that your site will not be affected by their network. Utility Assets will not acknowledge receipt of this enquiry, or any subsequent chases, unless their network will be affected.

See

Full Terms and Conditions can be found on the following URL:
<http://www.landmarkinfo.co.uk/Terms/Show/515>

Please note that Utilities Reports have a validity of 3 months from the date of purchase.

If you experience difficulties accessing our Terms and Conditions, please telephone our Customer Service Team on 0844 844 9966.

Utilities Report



Affected Utilities

Virgin Media

CHECKED



ATKINS
The Hub, 500 Park Avenue
Almondsbury
Bristol
BS32 4RZ

Virgin Media
Field Services
Units 1-12
Broad Lane
Mayfair Business Park
Bradford
Yorkshire
BD4 8PW

Tel: 0870 888 3116 Opt 2

Plant Enquiry Ref: VM.1150235
Letter Date 22.10.2019
Your Ref: 80473
Date: 23.10.2019

Dear Sir/Madam,

Enquiry Location:

Site off Hay Green Lane, Birdwell S70 5XQ

Thank you for your enquiry regarding work at the above location.
I enclose a copy of our above referenced drawing, marked to show the approximate position of plant owned and operated by Virgin Media.

You will be aware that you have a duty to ensure that no damage results to this equipment as a result of your proposed works. Please note that this apparatus may contain Fibre Optic, Coaxial and/or 240v Power Cables and as such, special care must be taken when excavating this area.

Should you require Virgin Media apparatus to be diverted we must agree a specification of works and provide a detailed estimate of costs. The costs are £720 (Business) or £240 (Residential) Inc VAT and the charge applies to each individual scheme requested. Both the estimate and specification will be sent to you within 25 working days of when the payment was received.

This initial payment will cover the following: -

- Detailed site visit by an experienced planning engineer.(Up to 10 hours planning time)
- Detailed specification of works.
- Detailed breakdown of costs.

Payment is required in advance for the estimated cost of detailed design work and the charge applies whether or not your works proceed. Please supply us with your payment and a copy of your plans or drawings and quote 'Our Ref' as above.

The address to send the cheque is:

Diversiory Works, Virgin Media, 1 Dove Wynd, Strathclyde Business Park Bellshill ML4 3AL

Or if you prefer to talk, please call the Diversiory Team on: 0800 408 0088 Option 1

Should your request be in relation to a Residential New Development, Virgin Media would like the opportunity to assist with your diversionary quote and serve your site free of charge, offering your customers the fastest widely available broadband speeds on the market up to 500Mbps.

For Commercial New Developments our team can also be reached through the below link, ensuring future businesses to your site are connected to our fibre network.

Simply head over to www.virginmedia.com/developer to fill in the enquiry form, and a member of our New Developments team will be in touch within 48 hours.

You will also find useful information about additional benefits to you and your site, plus a handy 'developers guide' can be downloaded with detailed installation requirements.

Or if you prefer to talk, please call the Diversiory Team on: 0800 408 0088 Option 2

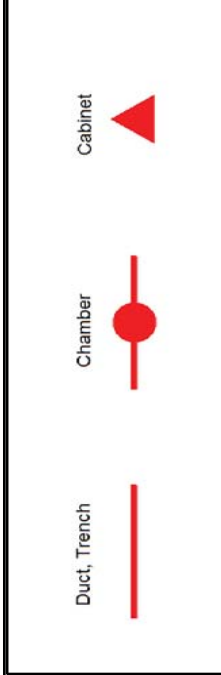
Yours faithfully

National Plant Enquiries Team,



(c) Crown copyright and database rights 2019 Ordnance Survey 100019209 Date: 23/10/19 Scale: 1:4715 Map Centre: 434861,401349 Data updated: 02/09/19 Telecons Plan A4

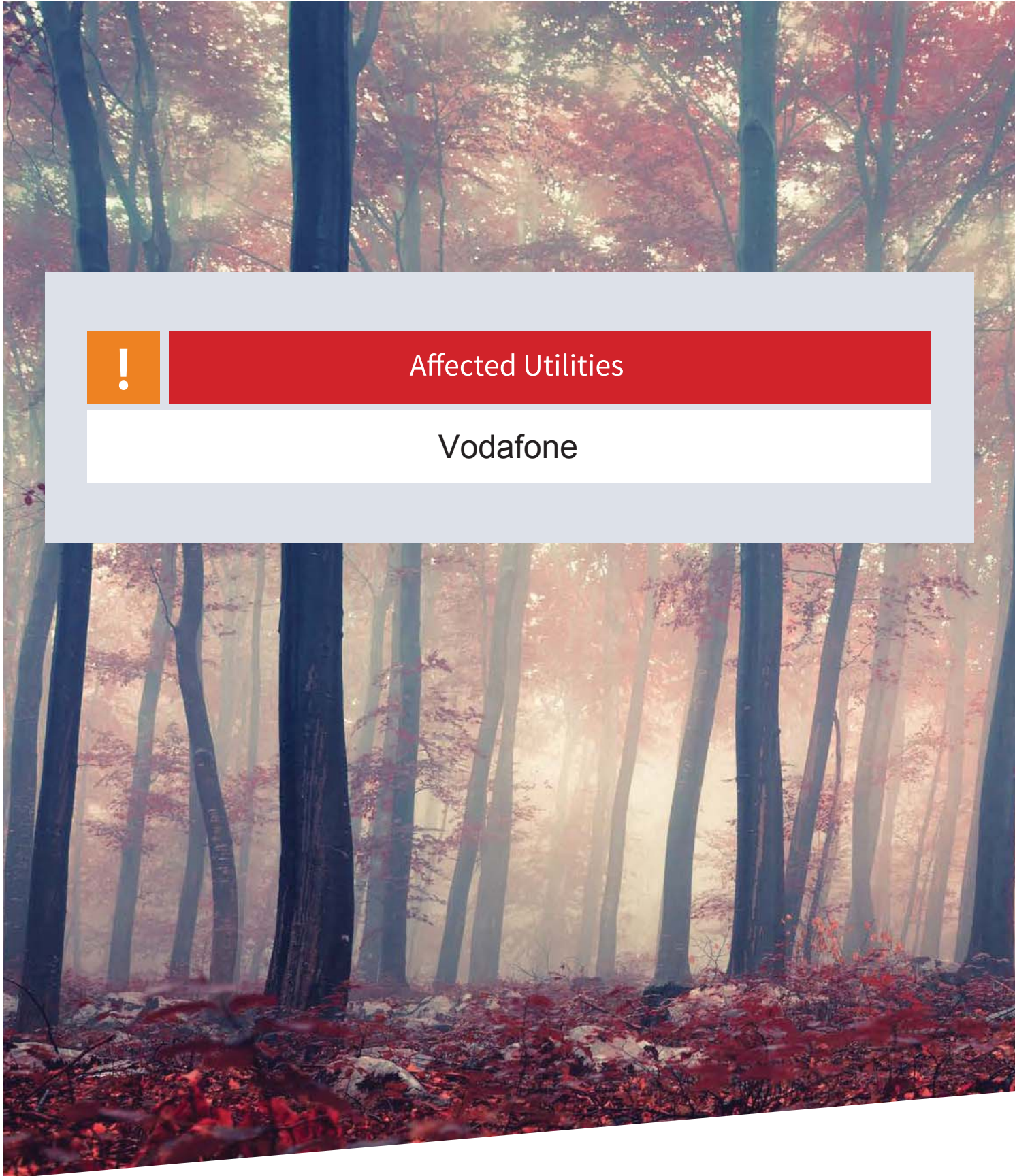
Important information - please read The purpose of this plan is to identify Virgin Media apparatus. We have tried to make it as accurate as possible but we cannot warrant its accuracy. In addition, we caution that within Virgin Media apparatus there may be instances where mains voltage power cables have been placed inside green, rather than black ducting. Further details can be found using the "Affected Postcodes.pdf", which can be downloaded from this website. Therefore, you must not rely solely on this plan if you are carrying out any excavation or other works in the vicinity of Virgin Media apparatus. The actual position of any underground service must be verified by cable detection equipment, etc. and established on site before any mechanical plant is used. Accordingly, unless it is due to the negligence of Virgin Media, its employees or agents, Virgin Media will not have any liability for any omissions or inaccuracies in the plan or for any loss or damage caused or arising from the use of and/or any reliance on this plan. This plan is produced by Virgin Media Limited (c) Crown copyright and database rights 2019 Ordnance Survey 100019209.



chilakala.apsar@virginmedia.co.uk
 VM: 1150235



Utilities Report



Affected Utilities

Vodafone

CHECKED

From: Badwannache, Sanjana
Sent: 23 October 2019 11:00
To: Utility Solutions GDC Requests
Subject: RE: Urgent Plant Enquiry - 80473 - Site off Hay Green Lane, Birdwell - Please respond by 25/10/2019
Attachments: 80473.pdf; Vodafone-External-Apparatus-Special-Requirements.pdf

Dear Sir,
The information on the attached Vodafone map does indicate that the proposed works will affect the Vodafone network.
Please refer to the attached information on the Vodafone website for further details.

Note: Only affected parts are printed and our network is not present in the remaining areas of your proposed works.

IMPORTANT - PLEASE READ = Your Next Step?:-

Where apparatus is affected and requires diversion, please send all the scheme related proposals that affects the Vodafone Network to c3requests@vodafone.com with a request for a 'C3 Budget Estimate'. Please ensure you include a plan showing proposed works. (A location plan is insufficient for Vodafone to provide a costing). These estimates will be provided by Vodafone directly, normally within 20 working days from receipt of your request. Please include proof of this C2 response when requesting a C3 (using the 'forward' option). Diversionary works may be necessary if the existing line of the highway/railway or its levels are altered.

Kind regards,

Anil Kumar
Senior Project Manager
anil.kumar@vodafone.com

ATKINS is a member of the Vodafone Group



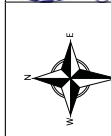
This response is made only in respect to electronic communications apparatus forming part of the Vodafone Limited electronic communications network formerly being part of the electronic communications networks of Cable & Wireless UK (now re-named Vodafone Enterprise UK), Energis Communications Limited, Thus Group Holdings Limited and Your Communications Limited.

PLEASE NOTE: The information given is indicative only. No warranty is made as to its accuracy. This information must not be solely relied upon in the event of excavation or other works carried out in the vicinity of Vodafone plant. No liability of any kind whatsoever is accepted by Vodafone, its servants, or agents, for any error or omission in respect of information contained on this information. The actual position of underground services must be verified and established on site before any mechanical plant is used. Authorities and contractors will be held liable for the full cost of repairs to Vodafone's apparatus and all claims made against them by Third parties as a result of any interference or damage.






From: Utility Solutions GDC Requests <requests.utilitysolutions@atkinglobal.com>
Sent: 22 October 2019 17:19
To: online@barnsley.gov.uk; plantenquiries@catelecomuk.com; plantenquiries@lastmile-uk.com; 'Environment agn' <enquiries@environment-agency.gov.uk>; plantenquiries@instalcom.co.uk; opburiedservicesenquiries@networkrail.co.uk; nrswa@sky.uk; assetrecords@utilityassets.co.uk; osp-team@uk.verizon.com; National Plant Enquiries <OSM.enquiries@atkinglobal.com>

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Legend

-  Underground Utility Box. Location Act., T02
-  Underground Route. Route Act. - Owned
-  Underground Route. Route Act. - Third Party



Vodafone Limited (No01471587) registered office is at Vodafone House, The Connection, Newbury, Berkshire, RC142FN

Plot Date : 23/10/2019 Scale : 1:1250

This plan shows apparatus owned by members of the Vodafone Group of companies (including legacy telecommunication companies currently within the group)

Information with regard to such apparatus should always be obtained from Vodafone or its appointed agents.



Special Requirements relating to the External Plant Network of Vodafone

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1. Introduction

This document sets out the procedure that will apply when Other Parties intend or are undertaking works in the vicinity of Vodafone apparatus (see Appendix B for further information on what constitutes Vodafone apparatus).

2. Purpose of document

This document provides a means by which the Vodafone specific special requirements relating to their apparatus, regardless of it being situated in the public highway / road, private street, land or any other areas, is made aware to Other Parties.



3. Scope

This document will be presented to Other Parties or Contractors to encourage those undertaking works within the vicinity of Vodafone apparatus to refer to and comply with. This is in order to protect where necessary the Vodafone apparatus and to avoid damage to the apparatus and loss of service.

A National Joint Utilities Group (NJUG) document NJUG Volume 3 Guidelines on the Management of Third Party Cable Ducting provides useful reference material.

It should be noted that, where appropriate, additional information on avoiding danger from underground apparatus is contained within the HSG47 guidance book titled "Avoiding Danger from Underground Services."

4. Vodafone Network and Apparatus

Damage to Vodafone apparatus is extremely disruptive and can be expensive to repair, especially where long lengths of cable have to be replaced.

In order to maintain the network integrity and minimise disruption to service, it is essential that disturbances are absolutely minimal. When working within the vicinity of Vodafone apparatus, extreme care is necessary in order to avoid costly repairs. The Other Parties / Contractor shall make every effort to ensure that disturbance of Vodafone apparatus is no more than is absolutely necessary for the completion of the works in accordance with their contract. It should be noted that it is an offence to interfere with Vodafone apparatus without first contacting the company for advice.

5. Plant records

It is the responsibility of the Other Parties undertaking works which may affect Vodafone apparatus to obtain all relevant Vodafone plant records from our agent Atkins Global prior to works commencing. This may be done by contacting the Atkins Global Plant Enquiries Team listed in Appendix B.

Plant records for such enquiries will generally be provided within 10 working days of receipt and in compliance with the New Roads and Street Works Act 1991 [NRSWA] requirements.

6. Definitions

The following definitions are applicable in this document:

- a) **Apparatus** - means all surface or sub-surface equipment and plant used by Vodafone including any associated cables or ducts owned, leased or rented by Vodafone.
- b) **Cable** - means any polythene or other sheath containing optical fibres or metallic conductors.
- c) **Depth of cover** - means the depth from the surface to the topmost barrel of the duct nest, in the case of ducts encased in concrete, to the top of the concrete, and in the case of directly buried cable, the top of the cable.
- d) **Jointing chamber** - means any manhole, surface box or other chamber giving access to Vodafone apparatus or their network.
- e) **Utility** - means an organisation licensed to provide gas, water, electricity, Cable TV or telecommunications services.
- f) **Developer** - means an organisation licensed to develop industrial/residential premises or given license to connect to utility apparatus.

Special Requirements relating to the External Plant Network of Vodafone



- g) **Contractor** - means the individual, firm or company contracted to undertake the work for a Utility or Other Parties.
- h) **Other Parties** - means the Utilities, Highway or Roads Authorities, Developers, Street/Roads Authority Section 50/109 licensees
- i) **Site** - means the location of, or in the vicinity of, the various works.

7. Requirements

Prior to commencing any work or moving heavy plant or equipment over any portion of the site, the Other Parties or Contractor shall notify Vodafone of their intentions. This may be done by contacting Vodafone via the contact list in Appendix B.

Upon receipt of this notification, Vodafone will identify if their apparatus is affected. If any Vodafone apparatus is affected by the works then they will arrange for the necessary records to be provided and confirm details of Vodafone apparatus and network operated within the affected area or adjacent to the proposed work site.

7.1 Location of Plant

It is the responsibility of the Other Parties or Contractors to undertake adequate plant location procedures. These may include searches for metallic cables which must be performed by actively inducing a signal in a cable conductor via a transmitter. A passive search is not considered sufficient.

Before applying a tracing signal to the Vodafone apparatus, the Other Parties or Contractors shall seek confirmation from Atkins Global that the Vodafone apparatus will not suffer any disruption to its networks normal workings as a result of the nature of the signal being induced.

7.2 Trial excavations

Optic fibre cables are very susceptible to damage from excavation tools. They are not electrically conductive and cannot be located by radio induction methods. Once an approximate location is known, the exact location must be ascertained by means of hand dug pilot holes. Where the work to be carried out by the Other Party or Contractor involves excavation in the vicinity of our apparatus, the Other Party or Contractor shall, by trial excavation at his own expense, determine the exact location and depth of the Vodafone apparatus. All excavations adjacent to the Vodafone apparatus are to be carried out by hand until the extent and /or location of the apparatus is known.

All excavation work shall be executed in accordance with the current issue of Health and Safety series booklet HSG47, Avoiding danger from underground services.

8. Depths of cover

The Other Party or Contractor should note that the minimum depths of cover for Vodafone apparatus shall be maintained together with specified separation requirements. Where the minimum depths of cover specified by Vodafone cannot be maintained, the Other Party or Contractor shall at their own expense, carry out the instructions of Vodafone requirements for the protection or diversion of their apparatus.

The Other Party or Contractor should have particular regard to the possibility of encountering Vodafone apparatus (including ducts and cables), at depths of cover other than that reported.

Surface cables (such as cables on bridges or walls) which are liable to be placed in danger from the Other Parties or Contractors works shall be protected, at the Other Parties expense, as directed by the Vodafone representative.



9. Separation

Reference should be made to HSG47 to ensure that adequate separation is achieved. The following details outline the specific requirements of Vodafone and capture the HSG47 requirements.

9.1 High voltage cables

High voltage single core cables of 1000 V and above shall have a minimum clearance from Company Apparatus of 500 mm.

High voltage multi-core cables of 1000 V and above shall have a minimum clearance from Company Apparatus of 350 mm.

In exceptional circumstances where the above clearances cannot be maintained, the separating distance may be reduced to a minimum of 175 mm. In such circumstances, concrete, of a quality as directed by the Company Representative, must be inserted to completely fill the space between the High Voltage cable and the Company Apparatus, in accordance with the requirements of the Company Representative. Any further services must have a minimum clearance of 250 mm from the concrete.

9.2 Low voltage cables

Low voltage cables of less than 1000 V shall have a minimum clearance from Company Apparatus of 180 mm. In exceptional circumstances where the above clearance cannot be maintained, the separating distance may be reduced to a minimum of 75 mm. In such circumstances, concrete, of a quality as directed by the Company Representative, must be inserted to completely fill the space between the services, in accordance with the requirements of the Company Representative. Any further services must have a minimum clearance of 250 mm from the concrete.

9.3 Ancillary electrical apparatus

Street furniture such as lamp posts, traffic posts and other such ancillary electrical apparatus shall have a minimum clearance of 150 mm from underground Company Apparatus and 600mm clearance from above ground Company Apparatus.

9.4 High pressure gas mains and other Undertakers plant/equipment

High pressure gas mains shall have a minimum clearance of 450 mm from Company Apparatus. All other undertakers' plant and equipment, when running in parallel with Company Apparatus, shall have a minimum clearance of 200mm. Where gas mains cross Company Apparatus, the minimum clearance shall be 200mm. All other undertakers' plant and equipment, when running across Company Apparatus, shall have a minimum clearance of 100 mm. NJUG Volume 1, Guidelines on the positioning and colour coding of underground utilities' apparatus refers.

9.5 Other Undertakers plant

Other undertakers' plant and equipment which runs in parallel with Company Apparatus shall have a minimum clearance of 200mm. All other undertakers' plant and equipment when running across Company Apparatus shall have a minimum clearance of 100mm.

9.6 Tramways

Each separating distance shall be individually agreed with the Company Representative.



10. Jointing chambers

10.1 Protection

Footway type jointing chambers are not designed to withstand carriageway loadings.

Where such chambers are liable to be placed at risk, either temporarily or permanently, from vehicular traffic or from the movement of plant and/or equipment, they will need to be adequately protected. Alternatively, they may have to be demolished and rebuilt to carriageway standards, at the Other Parties or Contractors expense under supervision of Vodafone representative.

All Vodafone jointing chambers and / or other access points shall be kept clear and unobstructed. Access for vehicles, winches, cable drums and / or any further equipment required by Vodafone for the maintenance of its apparatus, must be maintained at all reasonable times.

10.2 Access

The covers to Vodafone jointing chambers and / or apparatus shall only be lifted by means of the appropriate keys and under the direct supervision of a Vodafone representative. Other Parties or Contractors shall not enter any Vodafone jointing chamber and / or apparatus unless under the supervision of a Vodafone representative and in any case not before the mandatory gas test has been carried out in the presence of Vodafone representative and such checks have shown it to be safe to enter the Vodafone chamber and / or apparatus. The Other Parties or Contractors shall be given reasonable access to Vodafone apparatus and chambers when required.

11. Notification periods

Where the Other Parties or Contractors works or the movement of plant or equipment may endanger Vodafone apparatus, the Other Party or Contractor shall give the Vodafone **at least 7 working days'** notice in writing of the intended date to commence operations.

No excavation should be made without first consulting the relevant Vodafone apparatus layout drawings, which will be made available from the Vodafone agent Atkins Global on request and allowing 28 working days for processing the relevant drawings. However, should this not be possible, direct contact should be made to the Atkins Global Plant Enquiries Team as soon as possible to assess the situation.

When excavating, moving or backfilling (including use of Foamed Concrete for Reinstatements – FCR) around Vodafone apparatus, Vodafone shall be given adequate prior written notice of the Other Parties or Contractors intentions, in order that the works may be adequately supervised. Such notice shall not be less than 3 working days.

12. Excavation and backfill

All excavations adjacent to Vodafone apparatus are to be carried out by hand until the extent and or location of the Vodafone apparatus is known.

Use of mechanical borers and / or excavators shall not be used without the supervisory presence of a Vodafone representative or a given exemption.

Shuttering of the excavation or support to Vodafone apparatus, at the Other Parties or Contractors expense, shall be used as directed by the Vodafone representative.

At least 7 working days' notice must be given to Vodafone in order that any special protective measures which may be required to protect Vodafone apparatus, at the Other Parties or Contractors expense, when equipment such as pile driving, explosives, laser cutting high powered RF equipment or RF test gear, is to be used in conjunction with the works.

Special Requirements relating to the External Plant Network of Vodafone

Other Parties or Contractors are advised to refer to the National Joint Utilities Group publication: NJUG Volume 1- Guidelines on the Positioning and Colour Coding of Underground Utilities' Apparatus

13. Foam concrete

If foam concrete is being used as the backfill material, it shall not be used either above or within 500 mm of any Company Apparatus. A suitable material in accordance with the specification for the Reinstatement of Openings in Highways shall be substituted.

14. Attendance of Company Representative

If a situation requires the attendance on site of a Vodafone representative for a continuous period of more than 6 hours, suitable facilities shall be provided by the Other Party or Contractor, at their expense, to meet the office and ablution requirements. If a situation arises that requires urgent attention Vodafone will endeavour to attend site within 2 hours for all other occasions arising, 24 hours.

15. Damage reports

In the event of any damage whatsoever occurring to Vodafone apparatus, the Other Party or Contractor shall immediately inform Vodafone by contacting their 24/7 number , (for contact details please refer to Appendix A).

All relevant costs of any subsequent repair and / or removal of the Vodafone apparatus shall be charged to the Other Party or Contractor, irrespective of who affects the repair.

The above requirements do not relieve the Other Party or Contractor of any of their obligations under their contract.





16. Appendix A – Street Works Team Contacts for Vodafone

Function	Address	Phone	Email Address
Streetworks Team	Vodafone Damage Claims, Pavilion 4, 1-2 Berkeley Square , 99 Berkeley Street Glasgow G3 7HR	0333 304 0759	utilitiescentre@vodafone.com
Customer Complaints	n/a	0333 304 0762	n/a
Liability Claims Or Damage to Vodafone Apparatus	Vodafone Damage Claims, Pavilion 4, 1-2 Berkeley Square , 99 Berkeley Street Glasgow G3 7HR	0333 304 1104	claims@vodafone.com
Diversionary Works C2	Atkins Global, The Hub, 500 Park Avenue, Aztec West, Bristol, BS32 4RZ	T: 01454 662881	osm.enquiries@atkinsglobal.com
Diversionary Works C3/C4 Escalations	Smale House, Floor 2E, 114 Great Suffolk Street, London, SE1 OSL	+44 13446 02635	c3requests@vodafone.com
Emergencies 24 Hour – Defects & Faults	n/a	0333 304 0762	n/a
Plant Enquiries Vodafone inc: Cable & Wireless; Mercury Communications; Thus Plc; Energis; Scottish Telecom; Your Comms; Norweb Comms	Atkins Global, The Hub, 500 Park Avenue, Aztec West, Bristol, BS32 4RZ	T: 01454 662881	osm.enquiries@atkinsglobal.com



17. Appendix B – What constitutes Vodafone Network

Vodafone own fibre network dedicated to business and residential users of telecommunications and has an international cable network that provides connectivity to 153 countries, either directly or indirectly through partners, reaching across the Atlantic Ocean, through Europe and on to India and throughout Asia. Spanning approximately 500,000 km in length, including interests in more than 69 major global cable systems, our next-generation network improves the quality and performance of telecommunications services through our use of advance optical and IP transmission.

In the UK & Ireland Vodafone's overall network includes the following legacy networks now owned through acquisitions or Company name changes.

Below are examples of what you could see on the streets and should be aware of:



Vodafone Limited



Cable & Wireless U.K



Special Requirements relating to the External Plant Network of Vodafone



Mercury Communications Limited



Energis Communications Limited



Thus plc



Special Requirements relating to the External Plant Network of Vodafone



Scottish Telecom



Your Communications



Special Requirements relating to the External Plant Network of Vodafone



Norweb Communications



Our apparatus is installed in roads and streets of UK and Ireland, however in some places is undistinguishable from other operators' apparatus, for example in City Centres where high quality infill modular paving chamber covers are found; some with labels and some without.

See below as examples:



Special Requirements relating to the External Plant Network of Vodafone



The apparatus shown here is now owned, maintained and still in operation by Vodafone and includes.

- Vodafone Limited
- Cable & Wireless U.K
- Mercury Communications Limited
- Energis Communications Limited
- Thus plc, now Thus Group Holdings Limited
- Your Communications Group Limited

Please see the Contact Details in Appendix A for Plant Enquiries and help on site.



18. About this Document

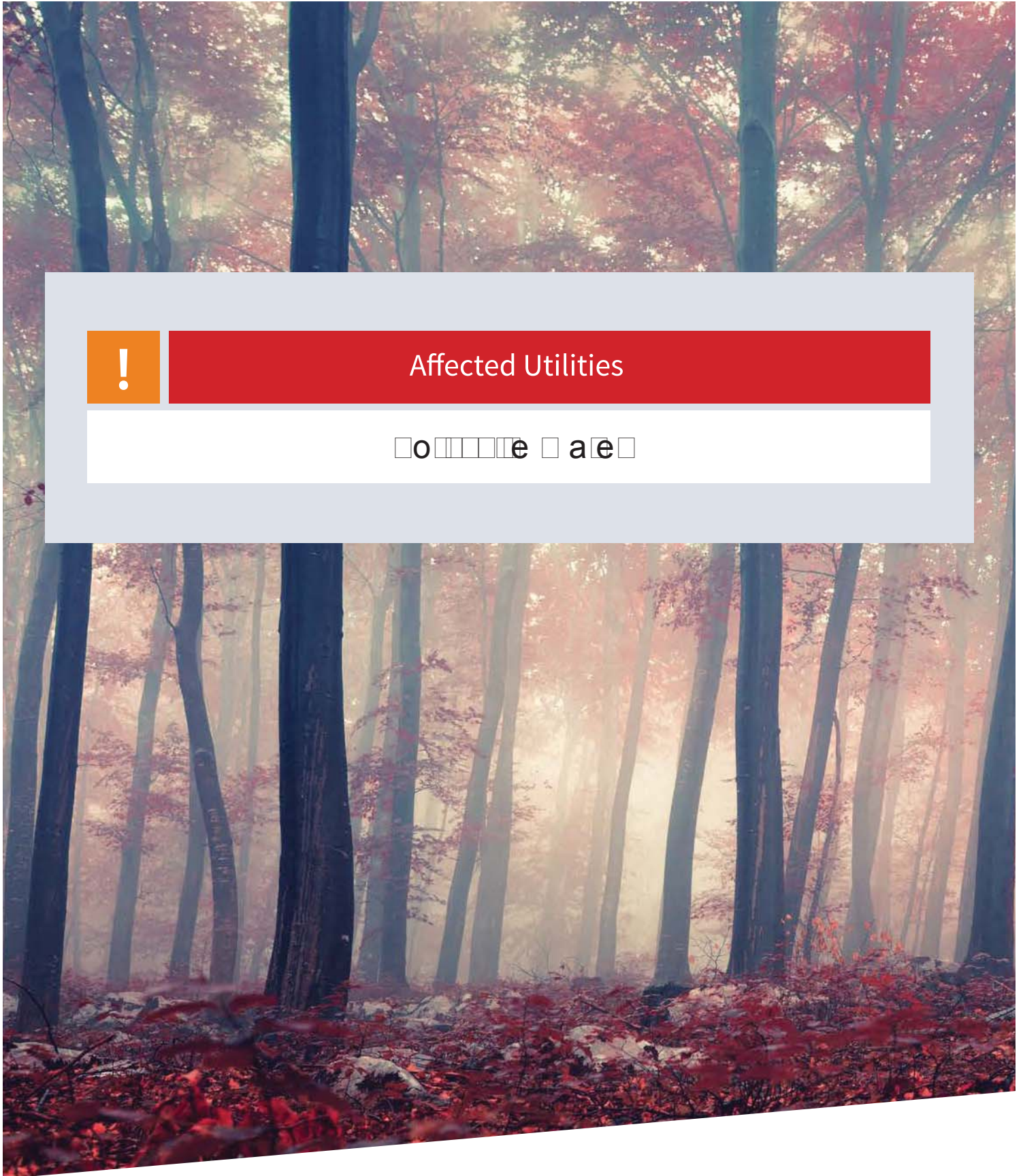
Content Owner

Changes since last version

Reformatted using the current Vodafone template to include updated Contact Details .

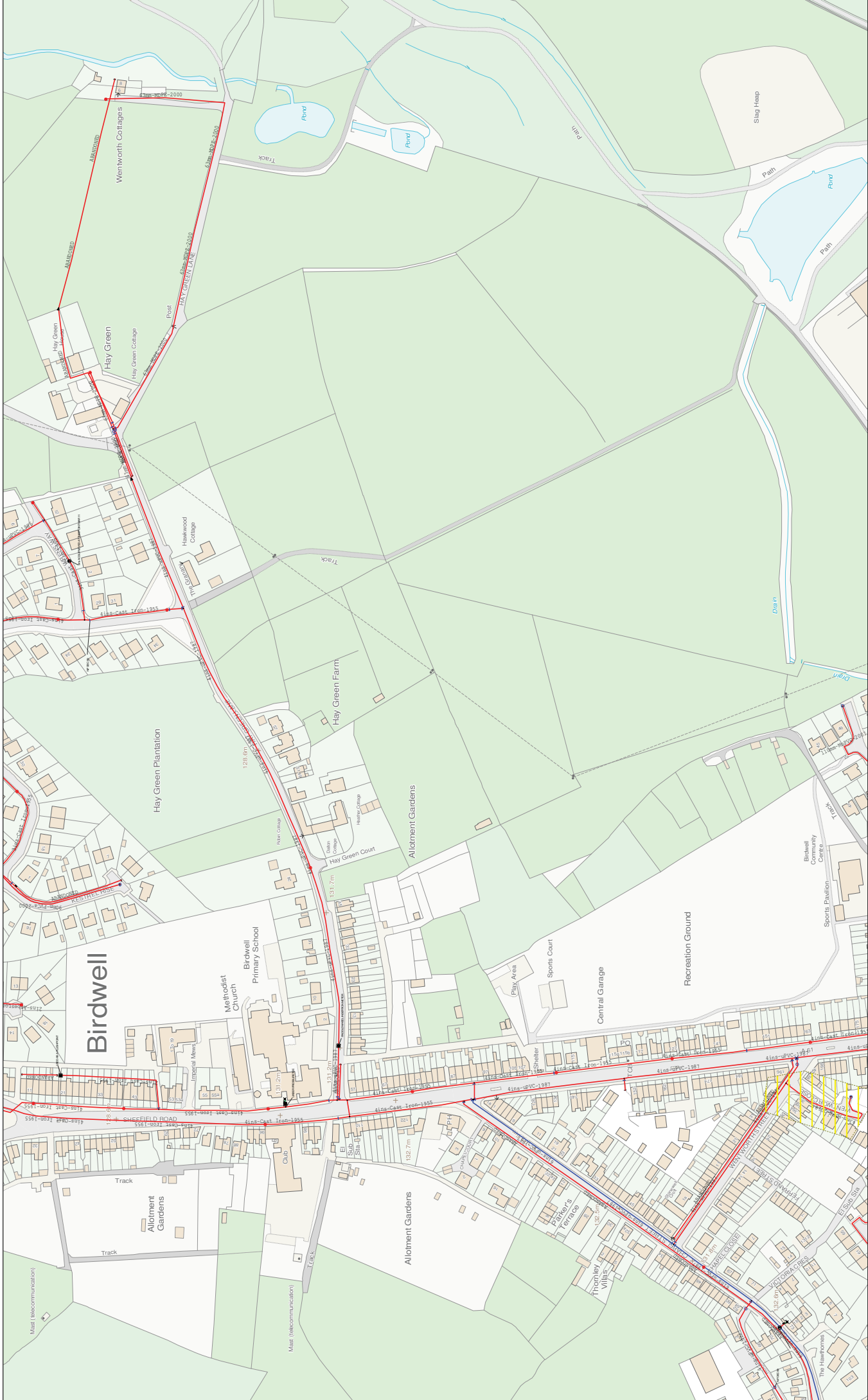
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Utilities Report



Affected Utilities

o e a e



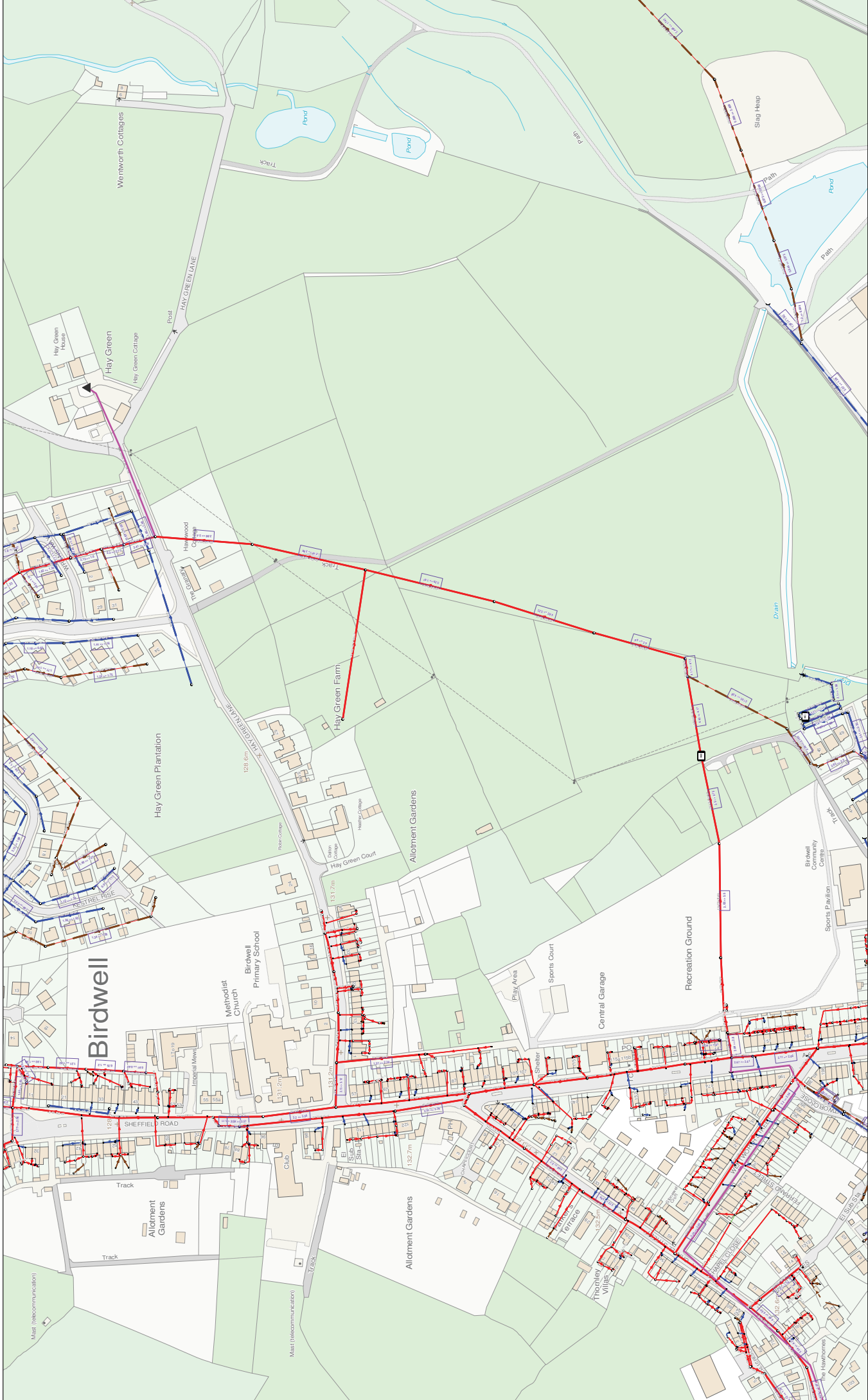
<p>Partial Key</p> <ul style="list-style-type: none"> — Water mains 60-104" in diameter — Water mains over 4" in diameter — Raw water mains — Private water mains 	<p>Title</p> <p>Notes</p>	<p>Map Name : SE3400NW</p> <p>Yorkshire Water, PO Box 500, Hallifax Road, Bradford BD6 2LZ Contact Name : Key Contact Tel :</p>	<p>434618 : 401 107</p>	<p>UPN: Undefined</p> <p>Originator: Kay.</p>
<p>The position of details of mains shown on this plan are approximate only. The exact position and depths should be obtained by excavational holes.</p>	<p>Scale : 1:2500</p> <p>Map No. :</p> <p>Date Req. : 23/10/2019, 10:30:53</p> <p>Date Gen. : 23/10/2019, 10:31:03</p> <p>Source : Water Network Enquiry</p>	<p>Map Name : SE3400NW</p> <p>Yorkshire Water, PO Box 500, Hallifax Road, Bradford BD6 2LZ Contact Name : Key Contact Tel :</p>	<p>434618 : 401 107</p>	<p>UPN: Undefined</p> <p>Originator: Kay.</p>

CHECKED



Birdwell

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This plan is intended as a general guide only and is not to be used as a basis for any construction or other works made in the ground. The user must refer to the relevant plans and specifications for the sewerage system. No liability is accepted for any errors or omissions in the plan.


Partial Key
Foul Sewer - F
Combined Sewer - C
Surface Water Sewer - SW
Trade Sewer - TD
Partially Separate - PS

Title	Notes
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434622 : 401 108

Map Name : SE3400NW

Yorkshire Water,
PO Box 500,
Hallifax Road,
Bradford BD6 2LZ
Contact Name :
Key
Contact Tel :

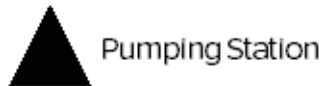


Property Identifier



Sewer Legend

	Combined Sewer		S24 Combined Sewer
	Surface Water Sewer		S24 Surface Water Sewer
	Foul Sewer		S24 Foul Sewer
	Section 104 Sewer		Rising Main
	Overflow Sewer		Abandoned Sewer
	Syphone Sewer & Vacuum Sewer		



Pumping Station



Public Sewer Treatment Works

Water Legend

	Water Main 4" and below
	Water Main 4" and above
	Raw Water Main
	Private Water Main
	Fire Hydrant
	Pumping Station

YORKSHIRE WATER PROTECTION OF MAINS AND SERVICES

1. The position of Yorkshire Water Services Ltd (YWS) apparatus shown on the existing mains record drawing(s) indicates the **general** position and nature of our apparatus and the accuracy of this information cannot be guaranteed. Any damage to YWS apparatus as a result of your works may have serious consequences and you will be held responsible for all costs incurred. Prior to commencing major works, the exact location of apparatus must be determined on site, if necessary by excavating trial holes. The actual position of such apparatus and that of service pipes which have not been indicated must be established on site by contacting the Customer Helpline on 0845 124 24 24 for both water and sewerage.
2. The public sewer and water network is lawfully retained in its existing position and the sewerage and water undertaker is entitled to have it remain so without any disturbance. The provisions of section 159 of the Water Industry Act 1991 provides that the undertaker may "inspect, maintain, adjust, repair or alter" the network. Those rights are given to enable the undertaker to perform its statutory duties. Any development of the land or any other action that unacceptably hindered the exercise of those rights would be unlawful. The provisions contained in Section 185 of the Water Industry Act 1991 state that where it is reasonable to do so, a person may require the water supply undertaker to alter or remove a pipe where it is necessary to enable that person to carry out a proposed change of use of the land. The provisions contained in Section 185 also require the person making the request to pay the full cost of carrying out the necessary works.
3. Ground levels over existing YWS apparatus are to be maintained. Sewers in highways will **generally** be laid to give 1200mm of cover from finished ground level working to kerb races, other permanent identification of the limits of the road or to an agreed line and level. Substantial increases or decreases to this 1200mm depth of cover will result in the sewer being re-laid at your expense. Water mains and services will **generally** be laid with a minimum of 750mm depth of cover however some mains and services usually those installed over 50 years ago may have less ground cover.
4. If surface levels are to be decreased / increased significantly the effects on existing water supply apparatus will be carefully considered and if any alterations are necessary, the costs of the alterations will be recharged to you in full. Outlets on fire hydrants must be no more than 300mm below the new levels and all surface boxes must be adjusted as part of the scheme.
5. To enable future repair works to be carried out without hindrance; any pipe, cable, duct, etc. installed parallel to a water main or service pipe should not be installed directly over or within 300mm of a water main or service pipe or 1000mm of a waste water asset. Where a pipe, cable, duct, etc. crosses a main or service it should preferably cross perpendicular or at an angle of no less than 45° and with a minimum clearance of 150mm. These requirements apply to activities within an existing highway and are relevant to the installation of pipes, cables, ducts, etc. up to and including 250mm in diameter (*see illustration below*). Necessary protection measures for installations greater than 250mm in diameter and/or in private land will need to be agreed on an individual basis. Installations within a new development site must comply with the National Joint Utilities Group publication Volume 2: NJUG Guidelines On The Positioning Of Underground Utilities Apparatus For New Development Sites.
6. All excavation works near to YW apparatus should be by hand digging only.
7. Backfilling with a suitable material to a minimum 300mm above YW apparatus is required.
8. Adequate support must be provided where any works pass under YW apparatus.
9. Jointing chambers, lighting columns and other structures must be installed in such a way that future repair or maintenance works to YW apparatus will not be hindered.
10. Apparatus such as; railings, sign posts, etc. must not be placed in such a way that they prevent access to or full operation of controlling valves, hydrants or similar apparatus. YWS surface boxes must not be covered or buried. Any adjustment, alteration or replacement of manhole covers must be agreed on site prior to the commencement of the works with a YWS Inspector who may be contacted via our Call Centre on 0845 124 24 24.
11. Explosives shall not be used within 100 metres of any Yorkshire Water Services apparatus or installations.
12. Vibrating plant should not be used directly over any apparatus. Movement or operation by vehicles or heavy plant is not to be permitted in the immediate vicinity of YWS plant or apparatus unless there has been prior consultation and, if necessary, adequate protection provided without cost to YWS.
13. **Under no circumstances** should thrust boring or similar trenchless techniques commence until the actual position of the Company's mains/services along the proposed route have been confirmed by trial holes.
14. Any alterations to the highway should be notified following the procedures outlined in the New Road and Street Works Act 1991 Code of Practice; Measures Necessary Where Apparatus Is Affected By Major Works (Diversions Works).
15. You will be held responsible for any damage or loss to YWS apparatus during and after completion of work, caused by yourselves, your servant or agent. Any damage caused or observed to YWS plant or apparatus should be immediately reported to YWS. Should YW incur any costs as a result of non-compliance with the above, all costs will be rechargeable in full.
16. You should ensure that nothing is done on the site to prejudice the safety or operation of YWS employees, plant or apparatus.

17. In accordance with the New Roads and Street Works Act 1991, Chapter 22, Part 3, Section 80. The location of any identified YW asset "*which is not marked, or is wrongly marked, on the records made available* " should be communicated back to Yorkshire Water. The location of the apparatus should be identified on copies of the supplied plans which should be returned to Yorkshire Water (Asset Records Team) with photographic supporting evidence where possible.
18. The Government has decided that responsibility for private sewers serving two or more properties and lateral drains (the section of pipe beyond the boundary of a single property, connecting it to the public sewer) will be transferred to the water companies on Oct 1 2011. Private pumping stations will also transfer during the period 1 October 2011 – 1 Oct 2016. Records of these assets may not yet be shown on the existing mains record drawing(s). If you encounter any of these assets you must inform Yorkshire Water Services Ltd (YWS).
19. Please note that the information supplied on the enclosed plans is reproduced from Ordnance Survey material with the permission of the Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office, © Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Licence Number 1000019559.
20. This information is for guidance only and the position and depth of any YW apparatus is approximate only. Likewise, the nature and condition of any YW apparatus cannot be guaranteed. YW has no responsibility for recording the locations of privately owned apparatus. As of 1 October 2011, there may be some lateral drains and/or public sewers which are not documented on YW records but may still be present. For the avoidance of doubt, this information is not a substitute for appropriate professional and/or legal advice. YW accepts no responsibility for any inaccuracy or omissions in this information. The actual position of YW apparatus must be determined on site by excavating trial holes by hand. YW requires a minimum of two working days' written notice of the intention to excavate any trial holes before any excavation can be undertaken. If there are any queries in this respect please contact Yorkshire Water on 0345 124 24 24.

Utilities Report



Affected Utilities

Zayo Group UK Ltd c/o JSM Group Ltd

CHECKED



Ms Christina Elliott
Atkins
500 Park Avenue Aztec West
Almondsbury Bristol
BS32 4RZ

Zayo Plant Protection Centre
c/o JSM Group Ltd
Plant Protection Department
Sterling House
Mutton Lane
Potters Bar
Herts, EN6 3AR

Date: 22/10/2019

Your Reference: LM 80473/AT

Our Reference: 16778795

Dear Ms Christina Elliott,

ZAYO GROUP LTD UK AFFECTED C2 PRELIMINARY PLANT ENQUIRY

We acknowledge with thanks your request dated 22/10/2019 12:14:49 PM for information on the location of our assets.

We confirm we have reviewed your proposed plan and have enclosed maps of the area in which Zayo Group UK Ltd have apparatus.

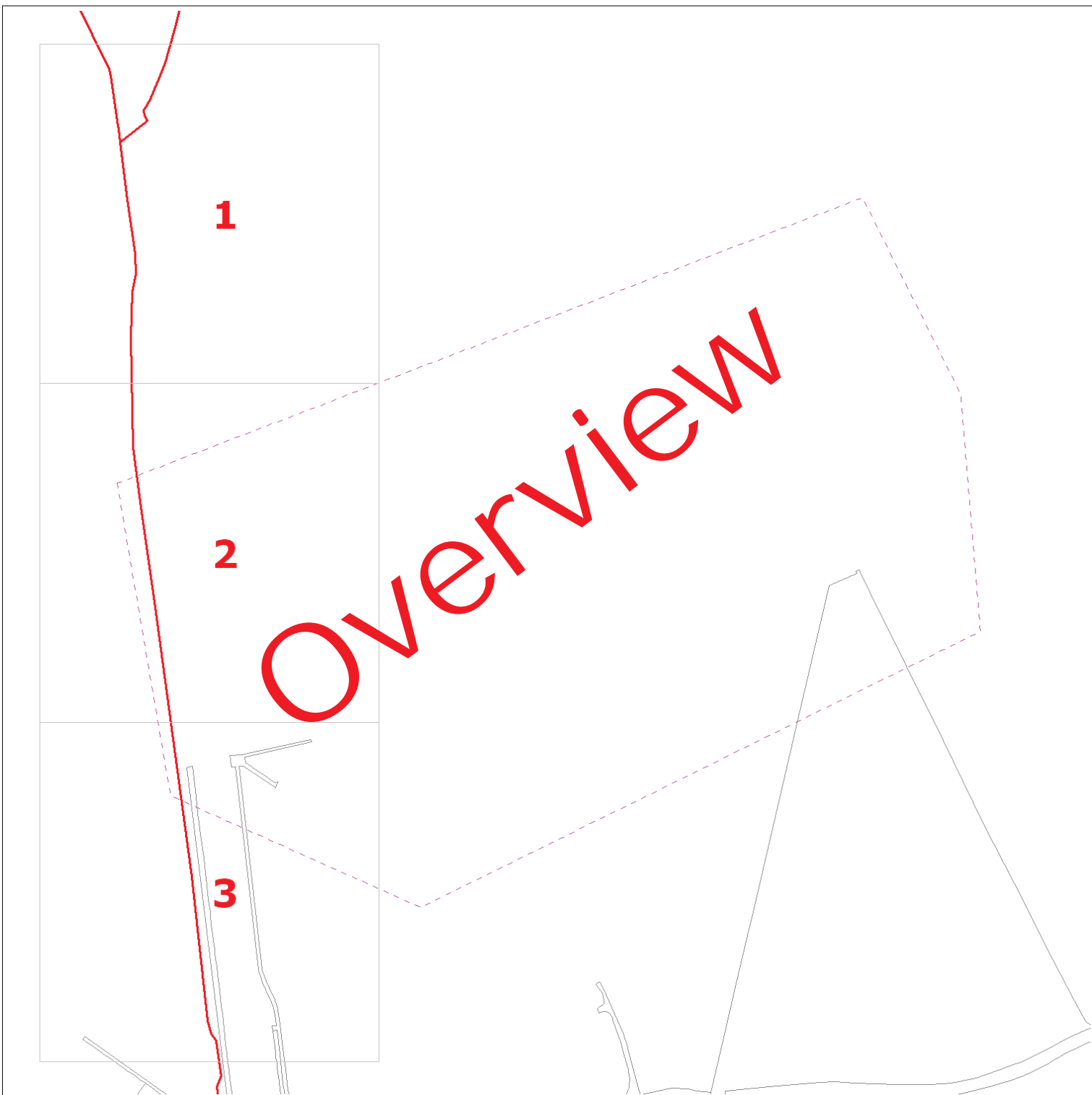
Please note these maps indicate approximate location only and their accuracy cannot be guaranteed. To determine the exact location a trial hole must be dug using extreme caution and hand dig methods only. Please refer to the attached document "Guide to Excavation within the vicinity of Zayo Apparatus".

Please forward all C3 and C4 Diversionary Estimate requests for diversionary works under the New Roads and Street Works Act 1991 "Measures necessary where apparatus is affected by Major Works (Diversionary Works), A Code of Practice", to zayodiversions@jsmgroup.com.

Please do not hesitate to contact us for further assistance.

Yours faithfully,

Zayo Group UK Ltd c/o JSM Group Ltd
JSM Plant Protection Department
T: 01992 655 919
zayoplantenquiries@jsmgroup.com



Date Requested: 22/10/2019

Requested by: Christina Elliott

Company: Atkins

Job Reference: 16778795

Your Scheme/Reference: LM 80473/AT

 ZAYO DUCT
 or  ZAYO CHAMBER
 Dig Sites: Line  Area 
 Scale on A4 paper: 1:1000



4th Floor Harmsworth House
13-15 Bouverie Street
London EC4Y 8DP

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JSM Group Ltd
Sterling House
Mutton Lane, Potters Bar
Hertfordshire, EN6 3AR
T: 01992 788 019



Protecting Lives, Cables & Pipes

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In Emergency Only and if Zayo Plant or Cables damaged call: 0800 169 1646

zayoplantenquiries@jsmgroup.com

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Date Requested: 22/10/2019

Requested by: Christina Elliott

Company: Atkins

Job Reference: 16778795

Your Scheme/Reference: LM 80473/AT

 ZAYO DUCT
 or  ZAYO CHAMBER
Dig Sites: Line  Area 
Scale on A4 paper: 1:1000

zayo
GROUP

4th Floor Harmsworth House
13-15 Bouverie Street
London EC4Y 8DP

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Sterling House
Mutton Lane, Potters Bar
Hertfordshire, EN6 3AR
T: 01992 788 019



Protecting Lives, Cables & Pipes

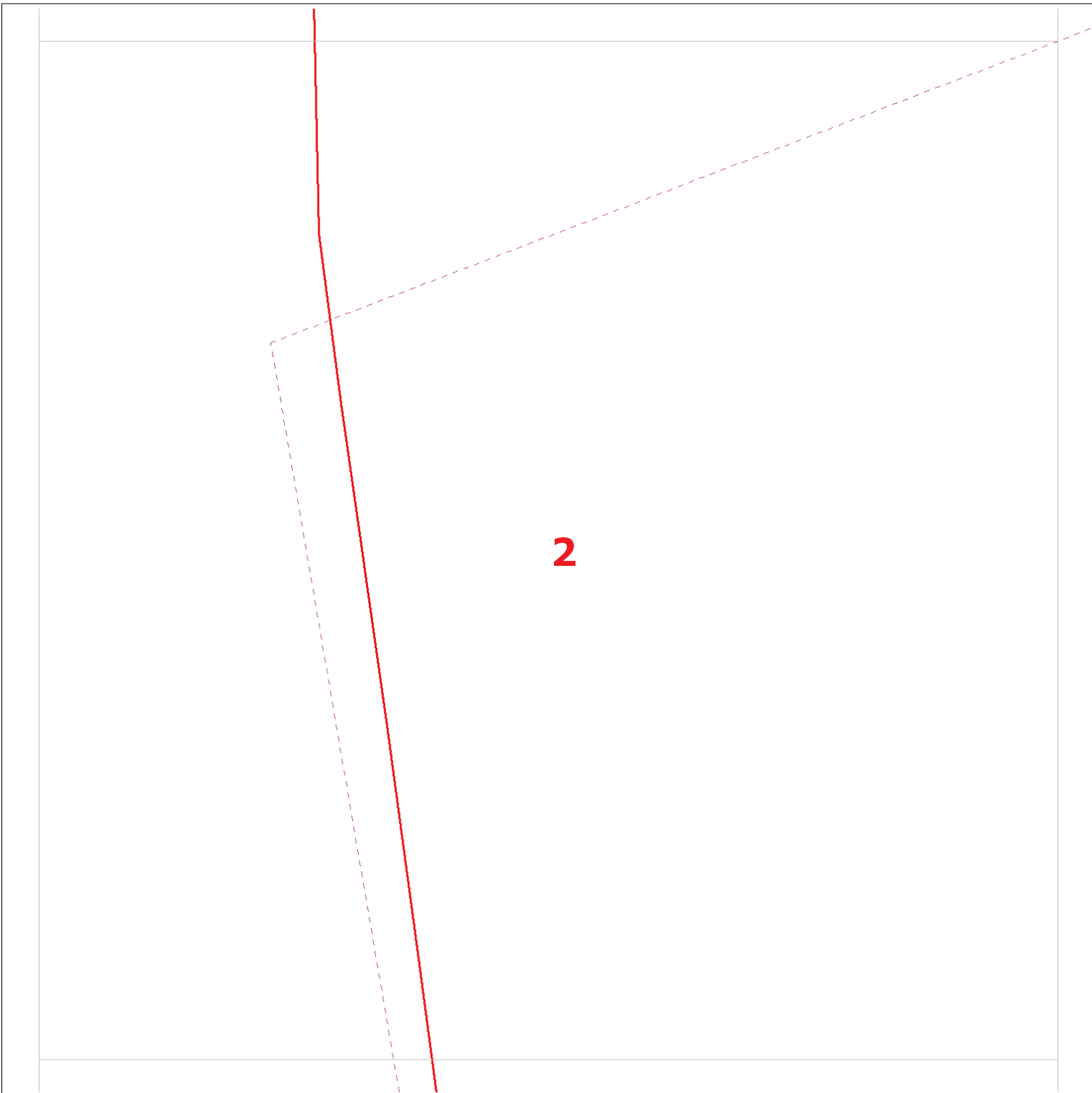
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Date Requested: 22/10/2019

Requested by: Christina Elliott

Company: Atkins

Job Reference: 16778795

Your Scheme/Reference: LM 80473/AT

 ZAYO DUCT
 or  ZAYO CHAMBER
 Dig Sites: Line  Area 
 Scale on A4 paper: 1:1000



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London EC4Y 8DP



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Date Requested: 22/10/2019

Requested by: Christina Elliott

Company: Atkins

Job Reference: 16778795

Your Scheme/Reference: LM 80473/AT

 ZAYO DUCT
 or  ZAYO CHAMBER
 Dig Sites: Line  Area 
 Scale on A4 paper: 1:1000



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Sterling House
Mutton Lane, Potters Bar
Hertfordshire, EN6 3AR
T: 01992 788 019



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zayoplantenquiries@jsmgroup.com

GUIDE TO CONTRACTORS UNDERTAKING EXCAVATIONS IN THE VICINITY OF ZAYO PLANT

1. Prior to commencing any work or moving heavy plant or equipment over any portion of the site, the Contractor shall confirm details of the location of the Zayo apparatus by contacting and requesting utility drawings from LinesearchbeforeUdig

All Enquirers should register free of charge for the Zayo plant enquiry service at LinesearchbeforeUdig <http://www.linesearchbeforeudig.co.uk/>

Or follow the direct link to register at <http://onecall.linesearchbeforeudig.co.uk/RegisterNewUser> and start your search there.

If you have any queries or wish to speak to a member of the JSM Plant Protection Team please call 01992 655 919.

The accuracy of information on the plans cannot be guaranteed and no liability can be accepted for errors or omissions.

2. Where the utility drawings show that the works or the movement of plant or equipment may endanger the Zayo Apparatus the Contractor must mark out the location of the Zayo Apparatus and ensure the apparatus is adequately protected from damage.
3. The contractor should note that damage to Zayo's Fibre-optic network is extremely disruptive and costly to reinstate. The Contractor shall make every effort to avoid the disturbance of Zayo's apparatus for the completion of the work.
4. When excavating, moving or backfilling around Zayo's apparatus The Contractor should note that the normal depth of cover for Zayo ducts are as follows:
 - Carriageway 600mm
 - Footway 350mm
 - Verge 350mm
5. With regard to excavation in the vicinity of Zayo's apparatus the Contractor should be aware of the possibility of reduced cover and the possibility of encountering Zayo apparatus at depths of cover less than that given above.
6. All excavation adjacent to Zayo apparatus is to be carried out by hand until the exact extent and/or location of the Zayo apparatus is known. Use spades and shovels in preference to other tools.

7. Do NOT use Mechanical borers and/or excavators within 0.5m of Zayo Apparatus.
8. To prevent any movement of Zayo apparatus during excavations, complete shuttering shall be used if:
 - The excavation is deeper than the depth of cover of the adjacent Zayo apparatus.
 - The excavation is within 1.0m of Zayo apparatus in stable ground.
 - The excavation is within 5.0m of Zayo apparatus in unstable ground.
9. If for the completion of the works the Contractor intends using any of the following:
 - Pile driving equipment within 10.0m of Company Apparatus.
 - Explosives within 20.0m of Company Apparatus.

Then the Contractor shall advise the Zayo Plant Protection Centre giving a minimum 10 working days written notice.

10. All Zayo manhole, joint box and /or other access points and chambers within the site shall be kept clear and unobstructed at all times to allow access by Zayo and /or their Contractor to carryout maintenance on the network. The Contractor should particularly note that footway type jointing chambers are not specified for carriageway loadings and will need to be adequately protected and/or demolished and rebuilt by Zayo where such chambers are likely to be placed at risk, either temporarily or permanently, from the movement of plant and/or equipment on the site.
11. The covers to Zayo chambers and/or apparatus shall only be lifted by means of appropriate manhole keys under the direct supervision of a Zayo Representative. No employee of the Contractor or of any sub-contractor employed by the Contractor shall enter any Zayo chamber and/or apparatus unless under the supervision of a Zayo Representative.
12. In the event of any damage whatsoever to Zayo apparatus, the Contractor shall immediately report the incidence to Zayo by contacting Zayo as follows:

Telephone: 0800 169 1646 (Zayo 24Hr Network Operations Centre)

Damage to Communications Plant is Expensive – Please Take Care

Please note these basic safety details are explained in detail in the HSE booklet HS(G)47 – Avoiding Danger from Underground Services.

Utilities Report



Not Affected Utilities

Some Utility Companies have replied to confirm they would not be affected by work on, or close to, the search area. Their responses are enclosed in the following pages for your records.

From: Plant Enquiries <plantenquiries@lastmile-uk.com>
Sent: 23 October 2019 16:42
To: Utility Solutions GDC Requests
Subject: RE: Urgent Plant Enquiry - 80473 - Site off Hay Green Lane, Birdwell - Please respond by 25/10/2019

Dear Sir/Madam,

Thank you for submitting your recent plant enquiry.

Based on the information provided, I can confirm that Energetics **does not** have any plant within the area(s) specified in your request.

If you require further assistance with outstanding enquiries, please call 03300 587 443.

Please ensure all plant enquiries are sent to plantenquiries@lastmile-uk.com

Regards

From: Utility Solutions GDC Requests <requests.utilitysolutions@atkinglobal.com>
Sent: 22 October 2019 12:49
To: online@barnsley.gov.uk; plantenquiries@catelecomuk.com; Plant Enquiries <plantenquiries@lastmile-uk.com>; 'Environment agn' <enquiries@environment-agency.gov.uk>; plantenquiries@instalcom.co.uk; opburiedservicesenquiries@networkrail.co.uk; nrswa@sky.uk; assetrecords@utilityassets.co.uk; osp-team@uk.verizon.com; National Plant Enquiries <OSM.enquiries@atkinglobal.com>
Subject: Urgent Plant Enquiry - 80473 - Site off Hay Green Lane, Birdwell - Please respond by 25/10/2019
Importance: High

Urgent- It would be greatly appreciated if you could reply ASAP, where possible by 25/10/2019. Thanks in advance.

Our Reference: 80473
Site Name: Site off Hay Green Lane, Birdwell
Works Description: Development Appraisal
Site Grid References: 434861 401349,434962 401403,434596 401346,434923 401495,434692 401203

To whom it may concern,

Please find enclosed a plant enquiry for your attention.

We request plans showing the location of your company's affected plant in relation to the entire site area shown within the boundary on the attached map. Grid references and postcodes relative to the site boundary are provided on the attached map to help you locate the site.

Within your response please quote our reference number and the name of the site shown above. If you do not have any apparatus in this area, please could you send written confirmation to declare that no apparatus is affected. Please also include information relating to the use and location of Radio Frequency Identification Devices (RFIDs) where available.

From: Enquiries, Unit <enquiries@environment-agency.gov.uk>
Sent: 23 October 2019 17:05
To: Utility Solutions GDC Requests
Subject: FW: Urgent Plant Enquiry - 80473 - Site off Hay Green Lane, Birdwell - Please respond by 25/10/2019
Attachments: 80473-Map.pdf; Standard_Notice sept 2012.pdf
Importance: High

ur ref SIN 3858

our ref 0

Site off Hay Green Lane, Birdwell
request for information under the Freedom of Information Act 2000 /
Environmental Information Regulations 2004
Thank you for your enquiry which was received on

We are not aware of any plant within the entire area shown in the boundary on the map provided.

I hope that we have correctly interpreted your request. Please see the attached Standard Notice or licence for details of permitted use.

We respond to requests for recorded information that we hold under the Freedom of Information Act 2000 and the associated Environmental Information Regulations 2004.

If you are not satisfied with our response to your request for information you can contact us within 2 calendar months to ask for our decision to be reviewed.

Yours sincerely

Jack Penning-Ashton

Customer Service Advisor, Incident Communication Service /
Contact Centre Services Part of Operations, Regulation / Customer



Tel: 0800 80 70 60

Web Site: www.gov.uk/environment/agency

Click an icon to keep in touch with us:



From: Utility Solutions GDC Requests [mailto:requests.utilitysolutions@atkinsglobal.com]

Sent: 22 October 2019 12:49

To: online@barnsley.gov.uk; plantenquiries@catelecomuk.com; plantenquiries@lastmile-uk.com; Enquiries, Unit <enquiries@environment-agency.gov.uk>; plantenquiries@instalcom.co.uk; opburiedservicesenquiries@networkrail.co.uk; nrswa@sky.uk; assetrecords@utilityassets.co.uk; osp-team@uk.verizon.com; National Plant Enquiries <OSM.enquiries@atkinsglobal.com>

Subject: Urgent Plant Enquiry - 80473 - Site off Hay Green Lane, Birdwell - Please respond by 25/10/2019

Importance: High

Standard notice [not for use with Special Data, Personal Data or unlicensed 3rd party rights]



Information warning

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From: plantenquiryservice@gtc-uk.co.uk
Sent: 22 October 2019 17:25
To: Utility Solutions GDC Requests
Subject: GTC Plant Enquiry - Ref- 1143279
Attachments: 1143279.png

GTC Apparatus Not Found In Search Area

Our Plant Enquiry Service Ref: 1143279
Your Enquiry Ref: LM 80473/AT

Dear Chrissy,

Thank you for your enquiry concerning apparatus in the vicinity of your proposed work. GTC can confirm that we have no apparatus in the vicinity but please note that other asset owners may have and ensure all utility owners have been consulted. For your records, the search area is shown in the attached map.

Please note our assets now include those owned and operated by:

- GTC Pipelines Limited
- Independent Pipelines Limited
- Quadrant Pipelines Limited
- Electricity Network Company Limited
- Independent Power Networks Limited
- Independent Water Networks Limited
- Independent Fibre Networks Limited
- Independent Community Heating Limited

If you have any queries or require any further information please do not hesitate to contact us.

Your sincerely,

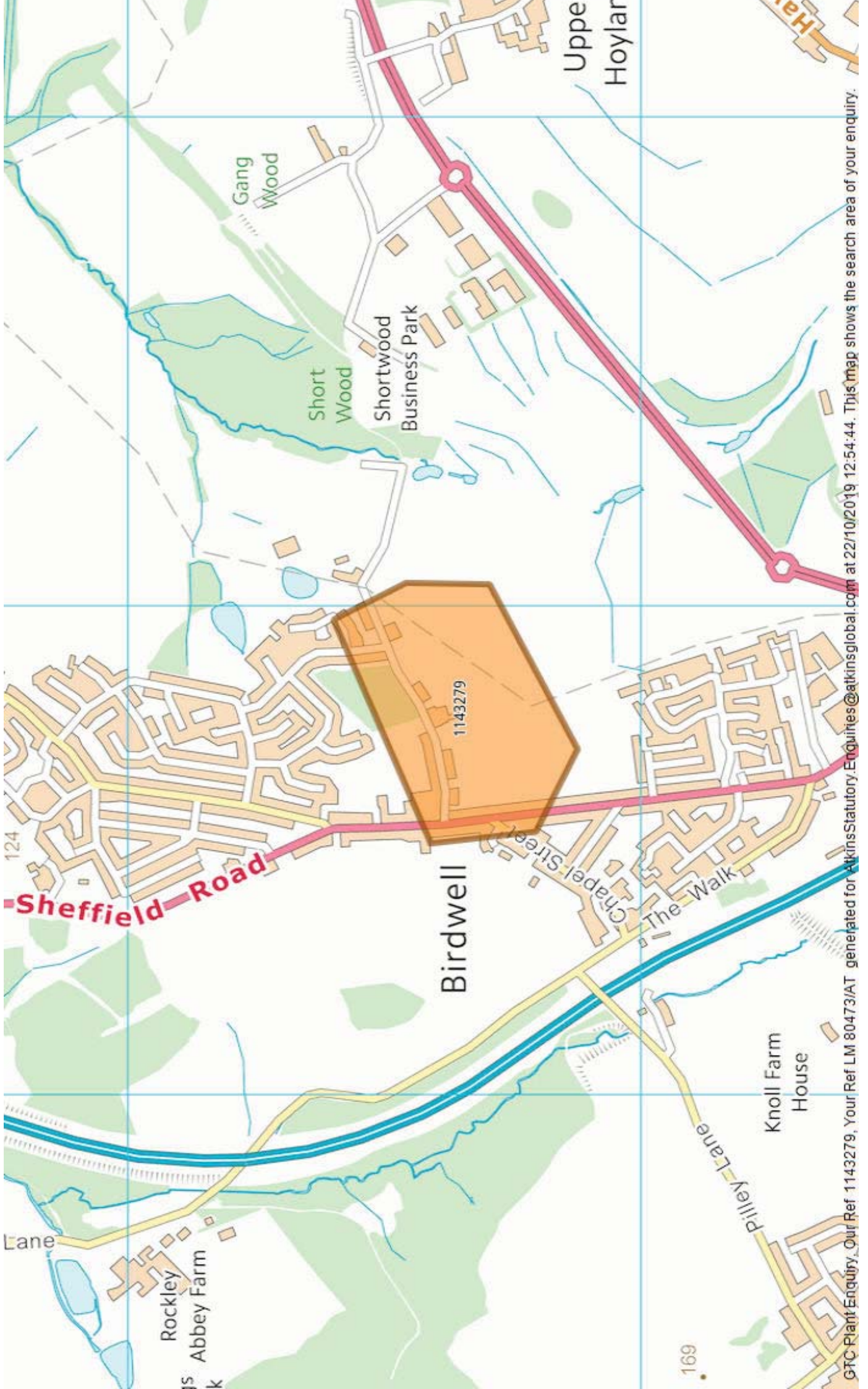
GTC Plant Enquiry Service.

GTC
Synergy House
Woolpit Business Park
Woolpit
Bury St Edmunds
Suffolk, IP30 9UP
Tel: 01359 240363
plant.enquiries@gtc-uk.co.uk

NOT:

This email originates from GTC, Synergy House, Woolpit Business Park, Woolpit, Bury St Edmunds, Suffolk, IP30 9UP

AT Number: GB688 8971 40. Registered No: 029431.



124

Sheffield Road

Birdwell

1143279

Gang Wood

Short Wood

Shortwood Business Park

Uppe Hoylar

Lane

Rockley Abbey Farm

Knoll Farm House

169

Pilley Lane

GTC Plant Enquiry, Our Ref 1143279, Your Ref LM 80473/AT generated for AtkinsStatutory.Enquiries@atkinsglobal.com at 22/10/2019 12:54:44. This map shows the search area of your enquiry.

From: Adams Mandy <Mandy.Adams@networkrail.co.uk> on behalf of OP Buried Services Enquiries
<OPBuriedServicesEnquiries@networkrail.co.uk>
Sent: 22 October 2019 18:52
To: Utility Solutions GDC Requests
Subject: RE: Urgent Plant Enquiry - 80473 - Site off Hay Green Lane, Birdwell - Please respond by 25/10/2019

With regards to your enquiry, Network Rail does not believe there is any Network Rail owned apparatus or underground services within the area you have defined. As there is always the possibility that new works could be planned and undertaken in this area by Network Rail this information is valid as at today's date and is supplied for general guidance only.

Please be aware that this response is based on Network Rail's records and knowledge and no guarantee can be given regarding accuracy or completeness. CAT scans, safe digging practices (as contained in HSE publications) and other appropriate investigative techniques should always be carried out.

There may be other apparatus or underground services owned or operated by Utility Companies and accordingly you should contact individual utilities for information.

If, in connection with your investigations and/or work, you become aware of Network Rail apparatus or underground services within your area of work, please ensure these are notified to our Asset Protection team via the following link as a matter of urgency so that appropriate measures for avoidance of risk and damage can be put in place.

Contact details can be found in the following link: [Network Rail Asset Protection Teams](#)

If you require any further clarification on any of the information please contact opburiedservicesenquiries@networkrail.co.uk.

Regards

Mandy Adams

Distribution Administrator, Worksite Survey



>> For service information and updates visit [AIS Hub](#)

>> For the latest news visit Route Services on [MyConnect](#)

From: NRSWA <nrswa.nrswa@sky.uk>
Sent: 22 October 2019 19:46
To: Utility Solutions GDC Requests
Subject: Urgent Plant Enquiry - 80473 - Site off Hay Green Lane, Birdwell - 25/10/2019



Thank you for your enquiry.

Please be advised that Sky Telecommunications Services Ltd will not be affected by your proposal.

Best endeavours have been made to ensure accuracy, however if you require further information, please contact us by email at nrswa@sky.uk.

Regards

NRSWA Department
Tech UK - Implementation
sky | TECHNOLOGY
✉ nrswa@sky.uk ☎ +44 20703232234

From: Utility Solutions GDC Requests <requests.utilitysolutions@atkinsglobal.com>
Sent: 22 October 2019 12:49
To: online@barnsley.gov.uk; plantenquiries@catelecomuk.com; plantenquiries@lastmile-uk.com; 'Environment agn' <enquiries@environment-agency.gov.uk>; plantenquiries@instalcom.co.uk; opburiedservicesenquiries@networkrail.co.uk; NRSWA <nrswa.nrswa@sky.uk>; assetrecords@utilityassets.co.uk; osp-team@uk.verizon.com; National Plant Enquiries <OSM.enquiries@atkinsglobal.com>
Subject: [EXTERNAL] Urgent Plant Enquiry - 80473 - Site off Hay Green Lane, Birdwell - Please respond by 25/10/2019
Importance: High

Urgent- It would be greatly appreciated if you could reply ASAP, where possible by 25/10/2019. Thanks in advance.

Our Reference: 80473
Site Name: Site off Hay Green Lane, Birdwell
Works Description: Development Appraisal
Site Grid References: 434861 401349,434962 401403,434596 401346,434923 401495,434692 401203

To whom it may concern,



We have checked SSE's website and in this instance your area is not affected.

From: UK OSP-Team <osp-team@uk.verizon.com>
Sent: 23 October 2019 12:12
To: Utility Solutions GDC Requests
Cc: UK OSP-Team
Subject: RE: Urgent Plant Enquiry - 80473 - Site off Hay Green Lane, Birdwell - Please respond by 25/10/2019

Dear Sir/Madam

Verizon is a licensed Statutory Undertaker.

We have reviewed your plans and have determined that Verizon (Formally known as MCI WorldCom, MFS) has no apparatus in the areas concerned.

If you have any further queries please do not hesitate to get in touch.

Yours faithfully

Plant Protection Officer (GB) Email osp-team@uk.verizon.com

From: Utility Solutions GDC Requests [mailto:requests.utilitiesolutions@atkinsglobal.com]
Sent: 22 October 2019 12:49
To: online@barnsley.gov.uk; plantenquiries@catelecomuk.com; plantenquiries@lastmile-uk.com; 'Environment agn'; plantenquiries@instalcom.co.uk; opburiedservicesenquiries@networkrail.co.uk; nrswa@sky.uk; assetrecords@utilityassets.co.uk; UK OSP-Team; National Plant Enquiries
Subject: [E] Urgent Plant Enquiry - 80473 - Site off Hay Green Lane, Birdwell - Please respond by 25/10/2019
Importance: High

Urgent- It would be greatly appreciated if you could reply ASAP, where possible by 25/10/2019. Thanks in advance.

Our Reference: 80473
Site Name: Site off Hay Green Lane, Birdwell
Works Description: Development Appraisal
Site Grid References: 434861 401349,434962 401403,434596 401346,434923 401495,434692 401203

To whom it may concern,

Please find enclosed a plant enquiry for your attention.

We request plans showing the location of your company's affected plant in relation to the entire site area shown within the boundary on the attached map. Grid references and postcodes relative to the site boundary are provided on the attached map to help you locate the site.

Important Consumer Protection Information

This search has been produced by Landmark Information Group Ltd, Imperium, Imperial Way, Reading, Berkshire, RG2 0TD.

Tel: 0844 844 9966
Fax: 0844 844 9980
Email: helpdesk@landmark.co.uk

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- Sets out minimum standards which firms compiling and selling search reports have to meet.
- Promotes the best practice and quality standards within the industry for the benefit of consumers and property professionals.
- Enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.

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- Display the Search Code logo prominently on their search reports.
- Act with integrity and carry out work with due skill, care and diligence.
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- Conduct business in an honest, fair and professional manner.
- Handle complaints speedily and fairly.
- Ensure that products and services comply with industry registration rules and standards and relevant laws.
- Monitor their compliance with the Code.

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Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.

TPOs Contact Details:

The Property Ombudsman scheme
Milford House
43-55 Milford Street
Salisbury
Wiltshire SP1 2BP

Tel: 01722 333306
Fax: 01722 332296
Web site: www.tpos.co.uk
Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk.
PLEASE ASK YOUR SEARCH PROVIDER IF YOU WOULD LIKE A COPY OF THE SEARCH CODE



Complaints Procedure

If you want to make a complaint, we will:

- Acknowledge it within 5 working days of receipt.
- Normally deal with it fully and provide a final response, in writing, within 20 working days of receipt.
- Keep you informed by letter, telephone or e-mail, as you prefer, if we need more time.
- Provide a final response, in writing, at the latest within 40 working days of receipt.
- Liaise, at your request, with anyone acting formally on your behalf.

Complaints should be sent to:

Landmark Information Group Ltd
Landmark UK Property
Imperium
Imperial Way
Reading
RG2 0TD

Tel: 0844 844 9966
Email: helpdesk@landmark.co.uk
Fax: 0844 844 9980

If you are not satisfied with our final response, or if we exceed the response timescales, you may refer the complaint to The Property Ombudsman Scheme (TPOS):

Tel: 01722 333306
Email: admin@tpos.co.uk

We will co-operate fully with the Ombudsman during an investigation and comply with his final decision.

APPENDIX F SITE RECONNAISSANCE PHOTOGRAPHS

<i>PHOTOGRAPHIC LOG</i>		
Photo no. 1	Date: 08.11.2019	
Direction photo taken: North west		
Description: View along public footpath towards Hay Green Lane		
Photo No. 2	Date: 08.11.2019	
Direction photo taken: North west		
Description: View across pastoral land in north eastern part of site, showing large felled tree		

Photo No. 3	Date: 08.11.2019	
Direction Photo Taken: North west		
Description: View of pastoral land and stable in eastern part of site		

Photo No. 4	Date: 08.11.2019	
Direction Photo Taken: North		
Description: View of waterlogged ground in eastern part of site		

Photo No. 5	Date: 08.11.2019	
Direction Photo Taken: North		
Description: View of waterlogged ground in eastern part of site		

Photo No. 6	Date: 08.11.2019	
Direction Photo Taken: South west		
Description: View of stables close to southern site boundary		


Photo No. 7	Date: 08.11.2019	
Direction Photo Taken: North west		
Description: View of densely vegetated inaccessible land in the western part of site		


Photo No. 8	Date: 08.11.2019	
Direction Photo Taken: South west		
Description: View of densely vegetated inaccessible land in the western part of site		

Photo No. 9	Date: 08.11.2019	
Direction Photo Taken: South east		
Description: View of pastoral land in northern part of site		

Photo No. 10	Date: 08.11.2019	
Direction Photo Taken: South east		
Description: View towards densely vegetated inaccessible area		


Photo No. 11	Date: 08.11.2019	
Direction Photo Taken: South		
Description: Flooded allotment		



Photo No. 12	Date: 08.11.2019	
Direction Photo Taken: South east		
Description: View across allotments		

Photo No. 13	Date: 08.11.2019	
Direction Photo Taken: East		
Description: View across pastoral land (horses and stables) in western part of site		

Photo No. 14	Date: 08.11.2019	
Direction Photo Taken: South east		
Description: Garages with possible asbestos cement sheet roofing		



APPENDIX G

TECHNICAL BACKGROUND

H1 Desk Study

Aquifer designation and Source protection zones

Principal aquifer: layers of rock or drift deposit that have high intergranular and/or fracture permeability (usually providing a high level of water storage). They may support water supply and/or river base flow on a strategic scale.

Secondary A aquifer: permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

Secondary B aquifer: predominantly lower permeability layers that may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.

Secondary undifferentiated aquifer: it has not been possible to attribute either a category A or B to a rock type. In most cases this means that it was previously designated as both a minor and non-aquifer in different locations owing to the variable characteristics.

Unproductive' strata: low permeability with negligible significance for water supply or river base flow.

The EA generally adopts a three-fold classification of source protection zones (SPZ) surround abstractions for public water supply. The Site is situated in an area defined as follows:

- Zone 1 or the 'inner protection zone' is located immediately adjacent to the groundwater source and is based on a 50-day travel time from any point below the water table to the source. It is designed to protect against the effects of human activity and biological/chemical contaminants that may have an immediate effect on the source
- Zone 2 or the 'outer protection zone' is defined by a 400-day travel time from a point below the water table to the source. The travel time is designed to provide delay and attenuation of slowly degrading pollutants
- Zone 3 or the 'total catchment' is the area around the source within which all groundwater recharge is presumed to be discharged at the source.

Preliminary risk assessment methodology

CLR11 outlines the framework to be followed for risk assessment in the UK. The framework is designed to be consistent with UK legislation and policies including planning. Under CLR11, three stages of risk assessment exist: preliminary, generic quantitative and detailed quantitative. An outline conceptual model should be formed at the preliminary risk assessment stage that collates all the existing information pertaining to a site in text, tabular or diagrammatic form. The outline conceptual model identifies potentially complete (termed possible) contaminant linkages (contaminant–pathway–receptor) and is used as the basis for the design of the site investigation. The outline conceptual model is updated as further information becomes available, for example as a result of the site investigation.



Production of a conceptual model requires an assessment of risk to be made. Risk is a combination of the likelihood of an event occurring and the magnitude of its consequences. Therefore, both the likelihood and the consequences of an event must be taken into account when assessing risk. RSK has adopted guidance provided in CIRIA C552 for use in the production of conceptual models.

The likelihood of an event can be classified on a four-point system using the following terms and definitions based on CIRIA C552:

- highly likely: the event appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution
- likely: it is probable that an event will occur or circumstances are such that the event is not inevitable, but possible in the short term and likely over the long term
- low likelihood: circumstances are possible under which an event could occur, but it is not certain even in the long term that an event would occur and it is less likely in the short term
- unlikely: circumstances are such that it is improbable the event would occur even in the long term.

The severity can be classified using a similar system also based on CIRIA C552. The terms and definitions relating to severity are:

- severe: short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resources. Catastrophic damage to buildings or property. Short-term risk to an ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000)
- medium: chronic damage to human health ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000), pollution of sensitive water resources, significant change in an ecosystem or organism forming part of that ecosystem
- mild: pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000). Damage to sensitive buildings, structures or the environment
- minor: harm, not necessarily significant, but that could result in financial loss or expenditure to resolve. Non-permanent human health effects easily prevented by use of personal protective clothing. Easily repairable damage to buildings, structures and services.

Once the probability of an event occurring and its consequences have been classified, a risk category can be assigned according to the table below.



		Consequences			
		Severe	Medium	Mild	Minor
Probability	Highly likely	Very high	High	Moderate	Moderate/low
	Likely	High	Moderate	Moderate/low	Low
	Low likelihood	Moderate	Moderate/low	Low	Very low
	Unlikely	Moderate/low	Low	Very low	Very low

Definitions of these risk categories are as follows together with an assessment of the further work that may be required:

- very high: there is a high probability that severe harm could occur or there is evidence that severe harm is currently happening. This risk, if realised, could result in substantial liability; urgent investigation and remediation are likely to be required
- high: harm is likely to occur. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required. Remedial works may be necessary in the short term and are likely over the long term
- moderate: it is possible that harm could arise, but it is unlikely that the harm would be severe and it is more likely that the harm would be relatively mild. Investigation is normally required to clarify the risk and determine the liability. Some remedial works may be required in the longer term
- low: it is possible that harm could occur, but it is likely that if realised this harm would at worst normally be mild
- very low: there is a low possibility that harm could occur and if realised the harm is unlikely to be severe.

H2 Site Investigation Methodology

Ground gas monitoring

An infrared gas meter was used to measure gas flow, concentrations of carbon dioxide (CO₂), methane (CH₄) and oxygen (O₂) in percentage by volume, while hydrogen sulphide (H₂S) and carbon monoxide (CO) were recorded in parts per million. Initial and steady state concentrations were recorded. In addition, during the first monitoring round, all wells were screened with a PID to establish if there are any interferences and cross-sensitivity of other hydrocarbons with the infrared gas meter.

Low flow groundwater sampling

Groundwater samples were retrieved using a United States Environment Protection Agency (USEPA) approved low-flow purging and sampling methodology.



The low-flow method relies on moving groundwater through the well screen at approximately the same rate as it flows through the geological formation. This results in a significant reduction in the volume of water extracted before sampling and significantly reduces the amount of disturbance of the water in the monitoring well during purging and sampling. Drawdown levels in the monitoring well and water quality indicator parameters (pH, temperature, electrical conductivity, redox potential and dissolved oxygen) are monitored during low-flow purging and sampling, with stabilisation indicating that purging is complete and sampling can begin. As the flow rate used for purging, in most cases, is the same or only slightly higher than the flow rate used for sampling, and because purging and sampling are conducted as one continuous operation in the field, the process is referred to as low-flow purging and sampling.

H3 Site Investigation Methodology

Statistical assessment

Statistical analysis of the results has been conducted in accordance with *Guidance on Comparing Soil Contamination Data with a Critical Concentration* (CIEH and CL:AIRE, 2008) as detailed in Appendix D.

Statistical analysis is utilised to establish whether the land is suitable for the proposed use under the land use planning system by attempting to answer a key question. For a site being developed the key question is: '*can we confidently say that the level of contamination on this land is low relative to some appropriate measure of risk?*' More specifically, this is expressed as '*Is there sufficient evidence that the true mean concentration of the contaminant (μ) is less than the critical concentration (C_c)?*', where the critical concentration could be the GAC or a site-specific assessment criterion (SSAC). The true mean (μ) is unknown and therefore a conservative estimate, termed the upper confidence limit (UCL), of this value is derived from the data. The UCL is then compared against the GAC.

In statistical terms the question above is handled through the use of a formal hypothesis – the null hypothesis and the alternate hypothesis. The statistical tests are structured to show (with a defined level of confidence, in this case 95%) which of the two hypotheses is most likely to be true, by determining whether the null hypothesis can be rejected.

For consideration under the planning regime, the null (H_0) and alternative (H_1) hypotheses are presented below.

Null and alternative hypotheses

Hypothesis	Equation	Description
Null (H_0)	$\mu \geq C_c$	The true mean concentration is equal to, or greater than, the critical concentration
Alternative (H_1)	$\mu < C_c$	The true mean concentration is less than the critical concentration

Therefore, if the null hypothesis is accepted for a certain contaminant it can be concluded that its concentration is high relative to the critical concentration, which in the case of this assessment is taken to be the GAC/SSAC and as such the whole site may be classed as being contaminated by a particular substance.



In addition, the statistical guidance provides an outlier test (Grubbs' test) that has been used within this assessment for the identification of 'outliers' or 'hotspots'. The 'outlier' test is conducted before undertaking statistical analysis (and 'outliers' may be removed from the dataset) but **only** where the conceptual model supports this.

The statistical tests applied to the dataset are selected based on whether the data is normally or non-normally distributed. The distribution of the dataset has been assessed using the Shapiro-Wilks normality test. Where the dataset has been found to be normally distributed the one sample t-test is undertaken. Where data has been found to be non-normally distributed Chebyshev's theorem is utilised.

Reuse of suitable materials

The Definition of Waste: Development Industry Code of Practice (CL:AIRE, 2011) (CoP) was developed in consultation with the Environment Agency and development industry to enable the re-use of materials under certain scenarios and subject to demonstrating that specific criteria are met. The current reuse scenarios covered by the CoP comprise

- reuse on the site of origin (with or without treatment)
- direct transfer of clean and natural soils between sites
- use in the development of land other than the site of origin following treatment at an authorised Hub site (including a fixed soil treatment facility).

The importation of made ground soils (irrespective of contamination status) or crushed demolition materials is not permitted currently under the CoP and requires either a standard rules environmental permit or a U1 waste exemption (see below).

In the context of excavated materials used on-sites undergoing development, four factors are considered to be of particular relevance in determining if the material is a waste or when it ceases to be waste:

- the aim of the Waste Framework Directive is not undermined, i.e. if the use of the material will create an unacceptable risk of pollution of the environment or harm to human health it is likely to be waste
- the material is certain to be used
- the material is suitable for use both chemically and geotechnically
- only the required quantity of material will be used.

The CoP requires the preparation of a materials management plan (MMP) that confirms the above factors will be met. This plan needs to be reviewed by a 'Qualified Person' (QP) who will then issue a declaration form to the EA. As the project progresses, data must be collated and on completion a verification report produced that shows the MMP was followed and describes any changes.

The MMP establishes whether specific materials are classified as waste and how excavated materials will be treated and/or reused in line with the CoP. The MMP is likely to form part of the site waste management plan.



APPENDIX H

EXPLORATORY HOLE RECORDS

TRIAL PIT LOG

Contract: Birdwell		Client: Harworth Group		Trial Pit: HP01
Contract Ref: 350283	Start: 16.07.20 End: 16.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.10	1	ES	T,V,J			Grass over soft brown slightly silty slightly clayey TOPSOIL. (TOPSOIL)	(0.25)	
						Firm to stiff orange mottled grey slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of mudstone and sandstone. (WEATHERED COAL MEASURES)	(0.25)	
0.50		V	c _u =49			Trial pit terminated at 0.50m depth.	0.50	

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit hand dug to 0.50m depth.
3. Trial pit terminated at 0.50m depth.
4. Trial pit backfilled with arisings in reverse order upon completion.

All dimensions in metres

Scale:

1:17

Method Used: Hand dug	Plant Used: Hand tools	Logged By: DHodder	Checked By: JH	
------------------------------	-------------------------------	---------------------------	-----------------------	--

TRIAL PIT LOG

Contract: Birdwell		Client: Harworth Group		Trial Pit: HP02	
Contract Ref: 350283		Start: 16.07.20 End: 16.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.05	1	ES	T,V,J		Backfill	Grass over soft brown slightly silty slightly clayey TOPSOIL. (TOPSOIL)	(0.25)	[Symbol]
						Firm to stiff orange mottled grey slightly sandy slightly gravelly CLAY. (WEATHERED COAL MEASURES)	(0.25)	
0.50		V	$c_u=54$			Trial pit terminated at 0.50m depth.	0.50	[Symbol]

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit hand dug to 0.50m depth.
3. Trial pit terminated at 0.50m depth.
4. Trial pit backfilled with arisings in reverse order upon completion.

All dimensions in metres

Scale:

1:17

Method Used: Hand dug	Plant Used: Hand tools	Logged By: DHodder	Checked By: JH	
------------------------------	-------------------------------	---------------------------	-----------------------	--

TRIAL PIT LOG

Contract: Birdwell		Client: Harworth Group		Trial Pit: HP03
Contract Ref: 350283	Start: 16.07.20 End: 16.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.40		V	c _v =48			MADE GROUND: Grass over soft brown slightly silty slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of sandstone, brick and ceramics. (COHESIVE MADE GROUND)	0.15	
						Firm to stiff orange mottled brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of sandstone. (WEATHERED COAL MEASURES)	(0.25)	
						Trial pit terminated at 0.40m depth.	0.40	

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit hand dug to 0.40m depth.
3. Trial pit terminated at 0.40m depth.
4. Trial pit backfilled with arisings in reverse order upon completion.

All dimensions in metres

Scale:

1:17

Method Used: Hand dug	Plant Used: Hand tools	Logged By: DHodder	Checked By: JH	
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TRIAL PIT LOG

Contract: Birdwell		Client: Harworth Group		Trial Pit: HP04	
Contract Ref: 350283		Start: 16.07.20 End: 16.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.05	1	ES	T,V,J			Grass over soft brown slightly sandy slightly silty CLAY. (TOPSOIL)	(0.20)	
						Firm to stiff orange mottled grey slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of mudstone and sandstone. (WEATHERED COAL MEASURES)	(0.30)	
						Trial pit terminated at 0.50m depth.	0.50	

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit hand dug to 0.50m depth.
3. Trial pit terminated at 0.50m depth.
4. Trial pit backfilled with arisings in reverse order upon completion.

All dimensions in metres

Scale:

1:17

Method Used: Hand dug	Plant Used: Hand tools	Logged By: DHodder	Checked By: JH	
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TRIAL PIT LOG

Contract: Birdwell		Client: Harworth Group		Trial Pit: HP05	
Contract Ref: 350283		Start: 16.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1
End: 16.07.20					

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.05	1	ES			<p>MADE GROUND: Soft brown slightly clayey gravelly SAND. Gravel is angular to subangular fine to coarse of brick, concrete, sandstone and anthropogenic material. (GRANULAR MADE GROUND)</p>	0.15		
0.30		V	$c_u=45$			<p>Firm to stiff orange mottled grey slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of mudstone and sandstone. (WEATHERED COAL MEASURES)</p> <p>Trial pit terminated at 0.30m depth.</p>		0.30

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit hand dug to 0.30m depth.
3. Trial pit terminated at 0.30m depth.
4. Trial pit backfilled with arisings in reverse order upon completion.

All dimensions in metres

Scale:

1:17

Method Used: Hand dug	Plant Used: Hand tools	Logged By: ASHoward	Checked By: JH	
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TRIAL PIT LOG

Contract: Birdwell		Client: Harworth Group		Trial Pit: HP06	
Contract Ref: 350283		Start: 16.07.20 End: 16.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.15	1	ES	T,V,J		[Cross-hatched pattern]	Grass over soft brown slightly sandy slightly gravelly CLAY. Gravel is angular to subangular, fine to coarse of coal, sandstone and mudstone. (TOPSOIL)	(0.30)	[Gravelly Clay Legend]
						Firm to stiff orange mottled grey slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of mudstone and sandstone. (WEATHERED COAL MEASURES)	(0.20)	[Weathered Clay Legend]
0.50		V	$c_u=50$			Trial pit terminated at 0.50m depth.		

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit hand dug to 0.50m depth.
3. Trial pit terminated at 0.50m depth.
4. Trial pit backfilled with arisings in reverse order upon completion.

All dimensions in metres

Scale:

1:17

Method Used: Hand dug	Plant Used: Hand tools	Logged By: DHodder	Checked By: JH	
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TRIAL PIT LOG

Contract: Birdwell		Client: Harworth Group		Trial Pit: HP07
Contract Ref: 350283	Start: 16.07.20 End: 16.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.05-0.10	1	ES	T,V,J			Grass over soft brown slightly sandy silty CLAY. (TOPSOIL)	(0.25)	
						Stiff yellowish orange mottled grey slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of mudstone and sandstone. (WEATHERED COAL MEASURES)	(0.25)	
0.50		V	c _u =49			Trial pit terminated at 0.50m depth.		

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit hand dug to 0.50m depth.
3. Trial pit terminated at 0.50m depth.
4. Trial pit backfilled with arisings in reverse order upon completion.

All dimensions in metres

Scale:

1:17

Method Used: Hand dug	Plant Used: Hand tools	Logged By: DHodder	Checked By: JH	
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TRIAL PIT LOG

Contract: Birdwell		Client: Harworth Group		Trial Pit: HP08
Contract Ref: 350283	Start: 16.07.20 End: 16.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.05-0.10	1	ES	T,V,J			Grass over soft brown slightly gravelly silty CLAY. Gravel is angular to subangular fine to coarse of mudstone and sandstone. (TOPSOIL)	(0.20)	
						Firm to stiff yellow mottled grey slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of mudstone and sandstone. (WEATHERED COAL MEASURES)	0.20	
						Trial pit terminated at 0.30m depth.	0.30	

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit hand dug to 0.25m depth.
3. Trial pit terminated at 0.25m depth.
4. Trial pit backfilled with arisings in reverse order upon completion.

All dimensions in metres

Scale:

1:17

Method Used: Hand dug	Plant Used: Hand tools	Logged By: DHodder	Checked By: JH	
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TRIAL PIT LOG

Contract: Birdwell		Client: Harworth Group		Trial Pit: HP09	
Contract Ref: 350283		Start: 16.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1
End: 16.07.20					

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.05-0.10	1	ES	T, V, J			Grass over soft brown slightly gravelly silty CLAY. Gravel is angular to subangular fine to coarse of mudstone and sandstone. (TOPSOIL)	(0.25)	
						Firm orange mottled grey slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of mudstone and sandstone. (WEATHERED COAL MEASURES)	0.25 0.30	
						Trial pit terminated at 0.30m depth.		

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit hand dug to 0.30m depth.
3. Trial pit terminated at 0.30m depth.
4. Trial pit backfilled with arisings in reverse order upon completion.

All dimensions in metres

Scale:

1:17

Method Used: Hand dug	Plant Used: Hand tools	Logged By: DHodder	Checked By: JH	
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TRIAL PIT LOG

Contract: Birdwell		Client: Harworth Group		Trial Pit: TP01	
Contract Ref: 350283		Start: 29.01.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1
End: 29.01.20					

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.10	1	ES	TJV			Grass over friable grey brown slightly gravelly clay TOPSOIL. Gravel is angular to subrounded fine to coarse sandstone and mudstone. (TOPSOIL)	0.15	
0.30	2	ES	TJV			Light grey brown clayey sandy angular to subangular medium to coarse GRAVEL of sandstone with moderate cobble content. Cobbles are subangular to angular sandstone. (WEATHERED COAL MEASURES)	(0.55)	
0.75	3	D				Friable light grey brown slightly gravelly CLAY. Gravel is angular to subangular fine to coarse sandstone. (WEATHERED COAL MEASURES)	0.80	
1.00	4	D				Medium strong thickly laminated light grey orange stained medium grained SANDSTONE. Recovered as angular to subangular medium to coarse gravel with a high cobble content. (COAL MEASURES)	(0.40)	
						Trial pit terminated at 1.20m depth.	1.20	

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Plan (Not to Scale)		General Remarks			
		1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Trial pit terminated at 1.20m due to difficult excavation. 3. SA01 undertaken in pit.			
		All dimensions in metres		Scale: 1:17	
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: LAlderman	Checked By: JH		

TRIAL PIT LOG

Contract: Birdwell		Client: Harworth Group		Trial Pit: TP02	
Contract Ref: 350283		Start: 29.01.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1
End: 29.01.20					

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.10	1	ES	TJV			Grass over soft grey brown slightly gravelly sandy clay TOPSOIL. Gravel is angular to subrounded fine to coarse sandstone and mudstone. (TOPSOIL)	(0.20) 0.20	
0.30	2	ES	TJV			Friable soft grey brown slightly gravelly sandy CLAY. Gravel is angular to subangular fine to coarse sandstone. (WEATHERED COAL MEASURES)	(0.35)	
0.40	3	D					0.55	
0.80	4	D	c _r =55/75/63			Firm to stiff light grey mottled orange brown slightly sandy slightly gravelly silty CLAY. Gravel is angular to subrounded fine to medium sandstone. (WEATHERED COAL MEASURES)	(1.35)	
0.80		V						
1.50	5	D					1.90	
						Hard strong thickly laminated light grey mottled orange brown fine to medium SANDSTONE. Recovered as slightly coarse sand angular to subangular medium to coarse with a high cobble content. (COAL MEASURES) Trial pit terminated at 1.95m depth.	1.95	

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Plan (Not to Scale) 		General Remarks 1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Trial pit terminated at 1.95m. 3. SA02 undertaken in pit.	
All dimensions in metres		Scale: 1:17	
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: L Alderman	Checked By: JH

TRIAL PIT LOG

Contract: Birdwell		Client: Harworth Group		Trial Pit: TP03
Contract Ref: 350283	Start: 29.01.20 End: 29.01.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.30	1	ES	TJV			Grass over friable brown grey slightly gravelly sandy clay TOPSOIL. Gravel is angular to subrounded fine to coarse sandstone, mudstone and coal. (TOPSOIL)	(0.20)	
						Friable brown slightly gravelly sandy CLAY. Gravel is angular to subrounded fine to coarse sandstone. (WEATHERED COAL MEASURES)	(0.50)	
1.00	2	D				Weak to medium strong thinly laminated light grey or mottled medium grained SANDSTONE. Recovered as slightly clayey sand angular to subangular fine to coarse gravel with high cobble content. Cobbles are angular to subangular. (COAL MEASURES)	(0.90)	
1.50	3	D					1.60	
Trial pit terminated at 1.60m depth.								

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Plan (Not to Scale) 	General Remarks	
	1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Trial pit terminated at 1.60m due to difficult to excavate. 3. SA03 undertaken in pit. 4. No groundwater was encountered.	
All dimensions in metres		Scale: 1:17
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: LAlderman Checked By: JH

TRIAL PIT LOG

Contract: Birdwell		Client: Harworth Group		Trial Pit: TP04
Contract Ref: 350283	Start: 29.01.20 End: 29.01.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.30	1	ES	TJV			Grass over friable grey brown slightly sandy slightly gravelly clay TOPSOIL. Gravel is angular to subrounded fine to coarse sandstone, mudstone and coal. (TOPSOIL) MADE GROUND: Orange brown slightly clayey sandy angular to subrounded fine to coarse. Gravel of sandstone, brick, rare coal, rare glass with high cobble content. Cobbles are angular to subangular sandstone. (GRANULAR MADE GROUND) ... with rare brick cobbles from 0.10m to 1.00m.	0.10	
							(1.80)	
2.00	2	ES	TJV			Firm to stiff indistinctly thickly laminated light grey mottled orange brown silty CLAY. (WEATHERED COAL MEASURES)	1.90	
							(0.80)	
2.50	3	D					2.70	
Trial pit terminated at 2.70m depth.								

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Plan (Not to Scale) 		General Remarks 1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Trial pit terminated at 2.70m due to difficult to excavate. 3. Slight groundwater seepage at 1.90m.	
All dimensions in metres		Scale: 1:17	
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: L Alderman	Checked By: JH

TRIAL PIT LOG

Contract: Birdwell		Client: Harworth Group		Trial Pit: TP05
Contract Ref: 350283	Start: 29.01.20 End: 29.01.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.50	1	ES	TJV		Grass over friable grey brown slightly sandy slightly gravelly clay TOPSOIL. Gravel is angular to subrounded fine to coarse sandstone, mudstone, rare wood. (TOPSOIL) MADE GROUND: Orange brown slightly clayey very sandy angular to subrounded fine to coarse GRAVEL of sandstone and rare brick. (GRANULAR MADE GROUND)	0.10	[Cross-hatch pattern]	
0.50	2	D				(0.85)		
1.00	3	ES	TJV		Orange brown slightly clayey sand angular to subangular fine to coarse GRAVEL of sandstone. (WEATHERED COAL MEASURES)	0.95	[Oval pattern]	
1.20	4	B			(0.35)			
					Medium to strong thickly laminated light grey orange stained medium grained SANDSTONE. Recovered as angular to subangular medium to coarse with high cobble content. (COAL MEASURES)	1.30	[Dotted pattern]	
					(0.20)			
					Trial pit terminated at 1.50m depth.	1.50		

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Plan (Not to Scale) 	General Remarks	
	1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Trial pit terminated at 1.50m. 3. No groundwater encountered.	
All dimensions in metres		Scale: 1:17
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: L Alderman Checked By: JH

TRIAL PIT LOG

Contract: Birdwell		Client: Harworth Group		Trial Pit: TP06	
Contract Ref: 350283		Start: 29.01.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1
End: 29.01.20					

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.10	1	ES	TJV			Grass over very soft grey slightly sandy slightly gravelly silty clay TOPSOIL. with slight strong odour. Gravel is angular to subrounded fine to coarse sandstone and mudstone. (TOPSOIL)	0.15	
0.60	2	ES	TJV			Firm to soft light grey mottled orange brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded, fine to medium sandstone. (WEATHERED COAL MEASURES)	(0.85)	
0.60		V	c _c =36/12			... 0.70m to 1.00m, with low cobble content. Cobbles are subangular to angular sandstone.		
1.20	3	D				Stiff to very stiff indistinctly thinly laminated light grey mottled yellow brown slightly sandy slightly gravelly silty CLAY with organic matter. Gravel is angular to subangular fine to coarse mudstone and coal. (WEATHERED COAL MEASURES)	1.00	
1.70	4	D					1.90	
						Weak to medium strong thinly to thickly laminated light brown grey medium grained SANDSTONE recovered as angular to subangular fine to coarse gravel. (COAL MEASURES)	1.95	
						Trial pit terminated at 1.95m depth.		

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Plan (Not to Scale) 		General Remarks 1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Trial pit terminated at 1.95m due to slow progress and with little recovery. 3. No groundwater encountered.	
All dimensions in metres		Scale: 1:17	
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: L Alderman	Checked By: JH

TRIAL PIT LOG

Contract: Birdwell		Client: Harworth Group		Trial Pit: TP07	
Contract Ref: 350283		Start: 30.01.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1
End: 30.01.20					

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.15						Grass over soft grey slightly sandy slightly gravelly clay TOPSOIL. Gravel is angular to subrounded fine to coarse sandstone, mudstone and coal. (TOPSOIL)	0.15	
0.30	1	ES	TJV			Firm to stiff light grey mottled orange brown slightly sandy slightly gravelly CLAY with occasional organic matter. Gravel is subangular to subrounded fine to medium sandstone with occasional cobble content. Cobbles are subangular to angular sandstone. (WEATHERED COAL MEASURES)	(1.00)	
0.50	2	D						
1.20	3	ES	TJV			Stiff to very stiff indistinctly thinly laminated light grey mottled orange brown slightly sandy slightly gravelly silty CLAY with occasional rootlets and occasional organic matter. Gravel is subangular to subrounded fine to coarse mudstone. (WEATHERED COAL MEASURES)	1.15	
1.50	4	D						
2.30	5	D				Grey orange stained thickly laminated MUDSTONE recovered as angular to subangular fine to coarse gravel. (COAL MEASURES)	2.15	
2.50	6	D				Black COAL. Recovered as a fine to coarse gravel. (SWALLOW WOOD COAL)	2.30	
2.50						Stiff light grey mottled yellow brown slightly gravelly silty CLAY with occasional organic matter. Gravel is angular to subrounded fine to medium coal and mudstone. (COAL MEASURES)	(0.20)	
2.60						Trial pit terminated at 2.60m depth.	2.50	
2.60							2.60	

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Plan (Not to Scale) 		General Remarks 1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Trial pit terminated at 2.60m. 3. No groundwater was encountered.	
All dimensions in metres		Scale: 1:17	
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: L Alderman	Checked By: JH

TRIAL PIT LOG

Contract: Birdwell		Client: Harworth Group		Trial Pit: TP201	
Contract Ref: 350283		Start: 16.07.20 End: 16.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.20	1	ES	T,V,J			Grass over soft brown slightly gravelly sandy CLAY. Gravel is angular to subangular fine to coarse of sandstone.	(0.25)	
						Orange / brown slightly clayey sandy angular to subangular fine to coarse GRAVEL.	0.25	
							(1.25)	
						Trial pit terminated at 1.50m depth.	1.50	

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Plan (Not to Scale) 		General Remarks 1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 3. Trial pit terminated at 1.50m depth. 4. Trial pit backfilled with arisings in reverse order upon completion.	
Method Used: Hand and machine dug		Plant Used: JCB-3CX	
All dimensions in metres		Scale: 1:17	
Logged By: DHodder		Checked By: JH	

TRIAL PIT LOG

Contract: Birdwell		Client: Harworth Group		Trial Pit: TP202	
Contract Ref: 350283		Start: 16.07.20 End: 16.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.10	1	ES	T,V,J			Grass over soft brown slightly gravelly sandy CLAY. Gravel is angular to subangular fine to coarse of sandstone.	(0.20) 0.20	
						Orange / brown slightly clayey sandy angular to subangular fine to coarse GRAVEL.	(1.30)	
						Trial pit terminated at 1.50m depth.	1.50	

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Plan (Not to Scale) 		General Remarks 1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 3. Trial pit terminated at 1.50m depth. 4. Trial pit backfilled with arisings in reverse order upon completion.	
All dimensions in metres		Scale: 1:17	
Method Used: Hand and machine dug	Plant Used: JCB-3CX	Logged By: DHodder	Checked By: JH

WINDOW SAMPLE LOG

Contract: Birdwell		Client: Harworth Group		Window Sample: WS101
Contract Ref: 350283	Start: 16.07.20 End: 16.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Progress Window Run	Samples / Tests				Water Backfill & Instru- mentation	Description of Strata	Depth (Thick- ness)	Material Graphic Legend
	Depth	No	Type	Results				
0.00 - 1.00 (115mm dia) 90% rec 1.00 - 1.80 (98mm dia) 60% rec	0.00-0.20	1	ES	1xT+1xJ+1xV		Long grass over soft brown sandy CLAY. Sand is fine to coarse. With frequent roots. (TOPSOIL)	0.20	
	0.60-0.70	2	ES	1xT+1xJ+1xV		Firm to stiff greyish brown mottled orangish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine of natural lithics (sandstone, coal, mudstone). (WEATHERED COAL MEASURES)	(0.90)	
						. . . from 0.90m, becoming very stiff. Becoming very stiff at 0.90m	1.10	
						Black Coal layer (recovered as black fine to coarse sand of coal). (SWALLOW WOOD COAL)	(0.30)	
	1.50-1.60	3	D			Very stiff greyish brown mottled orangish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine of natural lithics, sandstone, coal and mudstone. (WEATHERED COAL MEASURES)	(0.35)	
						Weathered weak brown fine to medium grained sandstone (recovered as chippings). (COAL MEASURES FORMATION)	1.75	
						Terminated at 1.80m due to refusal.	1.80	

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Drilling Progress and Water Observations						General Remarks
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	
16/07/20	09:00	1.00	-	115	Dry	1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. No groundwater encountered. 3. 50 mm diameter gas/groundwater monitoring well complete with flush protective cover installed to 1.50 m depth on completion. Response zone 0.5 m to 1.5 m depth. 4. Response zone 0.50 m to 1.50 m depth.
16/07/20	10:00	1.80	-	98	Dry	
All dimensions in metres						Scale: 1:25
Method Used: Tracked window sampling	Plant Used: Archway Competitor		Drilled By: Central Alliance	Logged By: ASHoward	Checked By: JH	

WINDOW SAMPLE LOG

Contract: Birdwell		Client: Harworth Group		Window Sample: WS102
Contract Ref: 350283	Start: 16.07.20 End: 16.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Progress Window Run	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
	Depth	No	Type	Results					
	0.00-0.30	1	ES	1xT+1xJ+1xV		Long grass over soft brown sandy CLAY. Sand is fine to coarse. With frequent rootlets. (TOPSOIL)	(0.30)		
	0.40-0.50	2	ES	1xT+1xJ+1xV		Firm to stiff greyish brown mottled orange slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of natural lithics (sandstone, coal, mudstone). Sand is fine to coarse. (WEATHERED COAL MEASURES)	(0.40)		
0.70-0.80	3	D		Black coal layer (recovered as black sand of coal). (SWALLOW WOOD COAL)		0.80			
	1.40-1.50	4	D			Stiff greyish brown mottled orangish brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to medium of natural lithics (sandstone, coal and mudstone). Sand is fine to coarse. (WEATHERED COAL MEASURES)	(1.00)		
	1.90-2.00	5	D			Stiff to very stiff blue grey slightly sandy CLAY. Sand is fine to coarse. (Partially lithified mudstone). (WEATHERED COAL MEASURES)	(0.40)		
						Weak bluey grey mudstone (recovered as chippings). (COAL MEASURES FORMATION)	2.20		
						Terminated at 2.30m due to refusal.	2.30		

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Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)		
16/07/20	10:00	0.00	-	0	Dry	1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. No groundwater encountered. 3. On completion, borehole backfilled with arisings.	
16/07/20		1.00	-	115	Dry		
16/07/20	11:00	2.30	-	98	Dry		
All dimensions in metres						Scale:	1:25
Method Used:	Tracked window sampling		Plant Used:	Archway Competitor		Drilled By:	Central Alliance
						Logged By:	ASHoward
						Checked By:	JH

WINDOW SAMPLE LOG

Contract: Birdwell		Client: Harworth Group		Window Sample: WS103
Contract Ref: 350283	Start: 16.07.20 End: 16.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Progress Window Run	Samples / Tests				Water Backfill & Instru- mentation	Description of Strata	Depth (Thick- ness)	Material Graphic Legend
	Depth	No	Type	Results				
0.00 - 0.20 ↑ 0.00 - 1.00 (115mm dia) 100% rec	0.00-0.20	1	ES	1xT+1xJ+1xV		Long grass over soft brown very sandy CLAY. Sand is fine to coarse. With frequent roots. (TOPSOIL)	(0.30)	
0.60-0.70 ↓	0.60-0.70	2	ES	1xT+1xJ+1xV		Firm to stiff orangish brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to medium of natural lithics (sandstone, coal, mudstone). Sand is fine to coarse. (WEATHERED COAL MEASURES) ... at 0.90m, becomes very stiff at 0.90m ... from 1.30m, becomes partially lithified.	(1.30)	
1.00 - 1.70 (98mm dia) 70% rec ↓	1.40-1.50	3	D			Moderately strong light brown fine to medium grained sandstone (recovered as chippings). (COAL MEASURES FORMATION) Terminated at 1.70m due to refusal.	1.60 1.70	

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Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)		
16/07/20	11:00	0.00	-	0	Dry	1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. No groundwater encountered. 3. 50 mm diameter gas/groundwater monitoring well complete with flush protective cover installed to 1.50 m depth on completion. Response zone 0.50 m to 1.50 m depth.	
16/07/20		1.00	-	115	Dry		
16/07/20	12:00	1.70	-	98	Dry		
All dimensions in metres						Scale:	1:25
Method Used:	Tracked window sampling		Plant Used:	Archway Competitor		Drilled By:	Central Alliance
						Logged By:	ASHoward
						Checked By:	J4



WINDOW SAMPLE LOG

Contract: Birdwell		Client: Harworth Group		Window Sample: WS104
Contract Ref: 350283	Start: 16.07.20 End: 16.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Progress Window Run	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
	Depth	No	Type	Results					
0.00 - 1.00 (115mm dia) 95% rec 1.00 - 1.70 (98mm dia) 60% rec	0.00-0.20	1	ES	1xT+1xJ+1xV		Long grass over soft brown very sandy CLAY. Sand is fine to coarse. With frequent roots. (TOPSOIL)	(0.30)		
	0.50-0.60	2	ES	1xT+1xJ+1xV		Firm to stiff orangish brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of natural lithics (sandstone, mudstone, coal). Sand is fine to coarse. (WEATHERED COAL MEASURES)	(0.40)		
	1.00-1.10	3	D			Stiff to very stiff orangish brown slightly gravelly very sandy CLAY. Gravel is subangular to subrounded fine to medium of natural lithics (mudstone, sandstone and coal). Sand is fine to coarse. (WEATHERED COAL MEASURES)	(0.90)		
						Weathered moderately strong light brown fine to medium grained sandstone (recovered as chippings and sand). (COAL MEASURES FORMATION)	(0.80)		
						Terminated at 1.70 due to refusal.	1.70		

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Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)		
16/07/20	13:00	0.00	-	0	Dry	1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. No groundwater encountered. 3. On completion, borehole backfilled with arisings.	
16/07/20		1.00	-	115	Dry		
16/07/20	14:00	1.80	-	98	Dry		
All dimensions in metres						Scale:	1:25
Method Used:	Tracked window sampling		Plant Used:	Archway Competitor		Drilled By:	Central Alliance
						Logged By:	ASHoward
						Checked By:	J4

WINDOW SAMPLE LOG

Contract: Birdwell		Client: Harworth Group		Window Sample: WS105
Contract Ref: 350283	Start: 16.07.20 End: 16.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Progress Window Run	Samples / Tests				Water Backfill & Instru- mentation	Description of Strata	Depth (Thick- ness)	Material Graphic Legend	
	Depth	No	Type	Results					
0.00 - 1.00 (115mm dia) 90% rec	0.00-0.20	1	ES	1xT+1xJ+1xV		MADE GROUND: Soft brown slightly gravelly very sandy CLAY. Gravel is subangular to subrounded fine to coarse of brick and natural lithics (mudstone). With frequent roots. (COHESIVE MADE GROUND)	(0.30)		
	0.70-0.80	2	ES	1xT+1xJ+1xV		Firm to stiff greyish brown mottled orange slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to medium of natural lithics (sandstone, mudstone, coal). Sand is fine to coarse. (WEATHERED COAL MEASURES)	(1.30)		
1.00 - 2.00 (98mm dia) 80% rec	1.20-1.30	3	D						
2.00 - 3.00 (85mm dia) 60% rec	2.30-2.40	4	D			Stiff bluey grey mottled orange slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of natural lithics (sandstone, mudstone, coal). (WEATHERED COAL MEASURES)	(2.00)		
3.00 - 4.00 (75mm dia) 70% rec	3.50-3.60	5	D			... from 2.60m, becomes very stiff and partially lithified. ... at 3.10m, becomes partially lithified.	(2.00)		
					Weak grey mudstone (recovered as chippings). (COAL MEASURES FORMATION)	(0.40)			
					Terminated at 4.00 due to refusal.	4.00			

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Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)		
16/07/20	14:00	0.00	-	0	Dry	1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. No groundwater encountered. 3. 50 mm diameter gas/groundwater monitoring well complete with flush protective cover installed to 3 m depth on completion. Response zone 1 m to 3 m depth.	
16/07/20		1.00	-	115	Dry		
16/07/20		2.00	-	98	Dry		
16/07/20		3.00	-	85	Dry		
16/07/20		3.60	-	75	Dry		
						All dimensions in metres	Scale: 1:25
Method Used: Tracked window sampling	Plant Used: Archway Competitor		Drilled By: Central Alliance	Logged By: ASHoward	Checked By: JH		

WINDOW SAMPLE LOG

Contract: Birdwell		Client: Harworth Group		Window Sample: WS106	
Contract Ref: 350283		Start: 16.07.20 End: 16.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Progress Window Run	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
	Depth	No	Type	Results					
0.00 - 1.00 (115mm dia) 50% rec	0.00-0.30	1	ES	1xT+1xJ+1xV		[Cross-hatched pattern]	MADE GROUND: Soft brown slightly gravelly very sandy CLAY. Gravel is subangular to subrounded fine to coarse of brick and natural lithics (mudstone, sandstone). Sand is fine to coarse. (MADE GROUND TOPSOIL)	(0.30)	[Cross-hatched pattern]
	0.50-0.60	2	ES	1xT+1xJ+1xV			Firm to stiff greyish brown mottled orange slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to medium of natural lithics (mudstone, sandstone, coal). Sand is fine to coarse. (WEATHERED COAL MEASURES)	(0.90)	[Dotted pattern]
1.00 - 2.00 (98mm dia) 100% rec	1.50-1.60	3	D				Stiff to very stiff bluish grey mottled orange sandy CLAY. Sand is fine to coarse. (WEATHERED COAL MEASURES)	(0.60)	[Horizontal lines]
							Very weak grey mudstone (recovered as chippings). (WEATHERED COAL MEASURES) ... at 1.80m, becomes partially lithified.	(0.50)	[Horizontal lines]
2.00 - 3.00 (85mm dia) 70% rec	2.50-2.60	4	D				Black coal (recovered as sand and gravel). (SWALLOW WOOD COAL)	(1.00)	[Solid black]
3.00 - 3.60 (75mm dia) 60% rec	3.40-3.50	5	D			Very weak weathered grey mudstone (recovered as chippings). (COAL MEASURES FORMATION)	(0.30)	[Horizontal lines]	
						Terminated at 3.60m due to refusal.			

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Drilling Progress and Water Observations						General Remarks						
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)							
16/07/20	15:00	0.00	-	0	Dry	1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. No groundwater encountered. 3. On completion, borehole backfilled with arisings.						
16/07/20		1.00	-	115	Dry							
16/07/20		2.00	-	98	Dry							
16/07/20		3.00	-	85	Dry							
16/07/20	16:00	3.60	-	75	Dry							
All dimensions in metres						Scale:	1:25					
Method Used:	Tracked window sampling		Plant Used:	Archway Competitor		Drilled By:	Central Alliance	Logged By:	ASHoward	Checked By:	JH	

WINDOW SAMPLE LOG

Contract: Birdwell		Client: Harworth Group		Window Sample: WS107
Contract Ref: 350283	Start: 17.07.20 End: 17.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Progress Window Run	Samples / Tests				Water Backfill & Instru- mentation	Description of Strata	Depth (Thick- ness)	Material Graphic Legend
	Depth	No	Type	Results				
0.00 - 1.00 (115mm dia) 95% rec	0.00-0.10	1	ES	1xT+1xJ+1xV		MADE GROUND: Soft brown slightly gravelly very sandy CLAY. Gravel is subangular to subrounded fine to medium of brick and natural lithics (mudstone, sandstone, coal). Sand is fine to coarse. With frequent roots. (MADE GROUND TOPSOIL)	0.20	
	0.30-0.40	2	ES	1xT+1xJ+1xV		Firm orangish brown sandy CLAY. Sand is fine to coarse. (WEATHERED COAL MEASURES)	(0.50)	
1.00 - 2.00 (98mm dia) 70% rec	1.30-1.40	3	D			Black coal (recovered as sand and gravels). (SWALLOW WOOD COAL)	(0.40)	
						Firm to stiff bluish grey mottled orange slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to medium of natural lithics (sandstone, mudstone, coal). Sand is fine to coarse. (WEATHERED COAL MEASURES) ... at 1.70m, becomes partially lithified.	1.10 (0.80)	
						Weak grey mudstone. (COAL MEASURES FORMATION) Terminated at 2.00m due to refusal.	1.90 2.00	

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Drilling Progress and Water Observations						General Remarks
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	
17/07/20	09:00	0.00	-	0	Dry	1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. No groundwater encountered. 3. 50 mm diameter gas/groundwater monitoring well complete with flush protective cover installed to 1.50 m depth on completion. Response zone 0.50 m to 1.50 m depth.
17/07/20		1.00	-	115	Dry	
17/07/20	10:00	2.00	-	98		
All dimensions in metres						Scale: 1:25
Method Used: Tracked window sampling	Plant Used: Archway Competitor		Drilled By: Central Alliance	Logged By: ASHoward	Checked By: JH	

WINDOW SAMPLE LOG

Contract: Birdwell		Client: Harworth Group		Window Sample: WS108
Contract Ref: 350283	Start: 17.07.20 End: 17.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Progress Window Run	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
	Depth	No	Type	Results					
	0.00-0.20	1	ES	1xT+1xJ+1xV			MADE GROUND: Brown slightly gravelly very clayey fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of brick and natural lithics (sandstone, mudstone, coal). With frequent roots. (MADE GROUND TOPSOIL)	(0.30)	
	0.40-0.50	2	ES	1xT+1xJ+1xV			Brown slightly gravelly very clayey fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of brick and natural lithics (sandstone, mudstone, coal). (WEATHERED COAL MEASURES)	(0.30)	
	0.80-0.90	3	ES	1xT+1xJ+1xV			Firm to stiff bluish grey mottled orange slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of brick and natural lithics (sandstone, mudstone, coal). (WEATHERED COAL MEASURES)	0.60	
	1.80-1.90	4	D				... from 2.20m, becomes very stiff.	(2.10)	
	2.50-2.60	5	D				Very weak grey mudstone (lithified clay). (COAL MEASURES FORMATION) (PENNINE MIDDLE COAL MEASURES FORMATION)	2.70	
								4.00	
Terminated at 4.00m due to refusal.									

Drilling Progress and Water Observations						General Remarks						
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)							
17/07/20	14:00	0.00	-	0	Dry	1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. No groundwater encountered. 3. On completion, borehole backfilled with arisings.						
17/07/20		1.00	-	115	Dry							
17/07/20		2.00	-	98	Dry							
17/07/20		2.80	-	85	Dry							
						All dimensions in metres	Scale: 1:25					
Method Used:	Tracked window sampling		Plant Used:	Archway Competitor		Drilled By:	Central Alliance	Logged By:	ASHoward	Checked By:	JH	

WINDOW SAMPLE LOG

Contract: Birdwell		Client: Harworth Group		Window Sample: WS109
Contract Ref: 350283	Start: 17.07.20 End: 17.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Progress Window Run	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend	
	Depth	No	Type	Results						
0.00 - 1.00 (115mm dia) 100% rec 1.00 - 2.00 (98mm dia) 70% rec	0.00-0.20	1	ES	1xT+1xJ+1xV			MADE GROUND: Long grass over soft slightly gravelly very clayey fine to coarse SAND. Gravel is subangular to subrounded fine to medium of natural lithics and brick. With frequent roots. (MADE GROUND TOPSOIL)	(0.30)		
	0.40-0.50	2	ES	1xT+1xJ+1xV			Firm to stiff greyish brown mottled orangish brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of natural lithics (mudstone, coal, sandstone). Sand is fine to coarse. (WEATHERED COAL MEASURES)	(1.20)		
	1.30-1.40	3	D				Weak grey mudstone. (COAL MEASURES FORMATION) (PENNINE MIDDLE COAL MEASURES FORMATION)	(0.50)		
							Terminated at 2.00m due to refusal.	2.00		

Drilling Progress and Water Observations						General Remarks						
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)							
17/07/20	11:00	0.00	-	0	Dry	1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. No groundwater encountered. 3. On completion, borehole backfilled with arisings.						
17/07/20		1.00	-	115	Dry							
17/07/20	12:00	2.00	-	98	Dry							
All dimensions in metres						Scale:	1:25					
Method Used:	Tracked window sampling		Plant Used:	Archway Competitor		Drilled By:	Central Alliance	Logged By:	ASHoward	Checked By:	JH	

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WINDOW SAMPLE LOG

Contract: Birdwell		Client: Harworth Group		Window Sample: WS110
Contract Ref: 350283	Start: 17.07.20 End: 17.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Progress Window Run	Samples / Tests				Water Backfill & Instru- mentation	Description of Strata	Depth (Thick- ness)	Material Graphic Legend
	Depth	No	Type	Results				
0.00 - 1.00 (115mm dia) 100% rec	0.00-0.10	1	ES	1xT+1xJ+1xV		MADE GROUND: Brown gravelly clayey fine to coarse SAND. Gravel is subangular to subrounded fine to medium of natural lithics and brick. With frequent rootlets. (MADE GROUND TOPSOIL)	0.20	
1.00 - 2.00 (98mm dia) 90% rec	0.60-0.70	2	ES	1xT+1xJ+1xV		Firm to stiff greyish brown mottled orange brown slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine to coarse of natural lithics (mudstone, sandstone, coal). (WEATHERED COAL MEASURES)	(1.50)	
2.00 - 3.00 (85mm dia) 60% rec	1.60-1.70	3	D			... at 1.50m, becomes very stiff and partially lithified.	1.70	
	2.50-2.60	4	D			Very weak grey mudstone. (COAL MEASURES FORMATION)	(1.00)	
						Black coal layer (recovered as sands and gravel). (SWALLOW WOOD COAL)	2.70	
						Weak orangish brown fine to coarse sandstone. (COAL MEASURES FORMATION)	2.90	
						Terminated at 3.00m due to refusal.	3.00	

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Drilling Progress and Water Observations						General Remarks
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	
17/07/20	12:00	0.00	-	0	Dry	1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. No groundwater encountered. 3. 50 mm diameter gas/groundwater monitoring well complete with flush protective cover installed to 1.50 m depth on completion. Response zone 0.50 m to 1.50 m depth.
17/07/20		1.00	-	115	Dry	
17/07/20		2.00	-	98	Dry	
17/07/20		13:00	3.00	-	85	
All dimensions in metres						Scale: 1:25
Method Used: Tracked window sampling	Plant Used: Archway Competitor		Drilled By: Central Alliance	Logged By: ASHoward	Checked By: JH	

WINDOW SAMPLE LOG

Contract: Birdwell		Client: Harworth Group		Window Sample: WS111
Contract Ref: 350283	Start: 17.07.20 End: 17.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Progress Window Run	Samples / Tests				Water Backfill & Instru- mentation	Description of Strata	Depth (Thick- ness)	Material Graphic Legend
	Depth	No	Type	Results				
0.00 - 1.00 (115mm dia) 95% rec 1.00 - 2.00 (98mm dia) 100% rec	0.00-0.20	1	ES	1xT+1xJ+1xV		Grass over brown slightly gravelly very clayey fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of natural lithics. With frequent roots. (TOPSOIL)	(0.30)	
	0.40-0.50	2	ES	1xT+1xJ+1xV		Firm to stiff greyish brown mottled orange slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to medium of natural lithics (mudstone, sandstone, coal). Sand is fine to coarse. (WEATHERED COAL MEASURES)	(1.70)	
1.40-1.50	3	D		... at 1.10m, becomes very sandy. ... at 1.50m, becomes very stiff to partially lithified.		2.00		
Terminated at 2.00m due to refusal.								

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Drilling Progress and Water Observations						General Remarks						
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)							
17/07/20	13:00	0.00	-	0	Dry	1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. No groundwater encountered. 3. 50 mm diameter gas/groundwater monitoring well complete with flush protective cover installed to 1.50 m depth on completion. Response zone 0.50 m to 1.50 m depth.						
17/07/20		1.00	-	115	Dry							
17/07/20	14:00	2.00	-	98	Dry							
All dimensions in metres						Scale:	1:25					
Method Used:	Tracked window sampling		Plant Used:	Archway Competitor		Drilled By:	Central Alliance	Logged By:	ASHoward	Checked By:	JH	

WINDOW SAMPLE LOG

Contract: Birdwell		Client: Harworth Group		Window Sample: WS112
Contract Ref: 350283	Start: 17.07.20 End: 17.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Progress Window Run	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
	Depth	No	Type	Results					
0.00 - 1.00 (115mm dia) 100% rec	0.00-0.10	1	ES	1xT+1xJ+1xV			Brown slightly gravelly clayey fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of natural lithics. With frequent roots. (TOPSOIL)	0.20	
1.00 - 2.00 (98mm dia) 90% rec	0.60-0.70	2	ES	1xT+1xJ+1xV			Firm to stiff light brown mottled orange slightly gravelly very sandy CLAY. Gravel is subangular to subrounded fine to medium of natural lithics (mudstone, sandstone, coal). (WEATHERED COAL MEASURES)	(2.60)	
2.00 - 3.00 (85mm dia) 70% rec	1.60-1.70	3	D				... at 1.80m, becomes very stiff. ... at 2.20m, becomes partially lithified.		
3.00 - 4.00 (75mm dia) 50% rec	2.70-2.80	4	D				Very weak grey mudstone. (COAL MEASURES FORMATION)	2.80	
	3.70-3.80	5	D					(1.20)	
							Terminated at 4.00 due to refusal.	4.00	

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Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)		
17/07/20	14:00	0.00	-	0	Dry	1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. No groundwater encountered. 3. On completion, borehole backfilled with arisings.	
17/07/20		1.00	-	115	Dry		
17/07/20		2.00	-	98	Dry		
17/07/20		3.00	-	85	Dry		
17/07/20	15:00	4.00	-	75	Dry		
All dimensions in metres						Scale:	1:25
Method Used:	Tracked window sampling		Plant Used:	Archway Competitor		Drilled By:	Central Alliance
						Logged By:	ASHoward
						Checked By:	JH



BOREHOLE LOG

Contract: Birdwell		Client: Harworth Group		Borehole: BH101
Contract Ref: 350283	Start: 15.07.20 End: 15.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 2

Drilling Progress Log		Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	Drill Time (hh:mm)					
		↓		Grass and low vegetation over brown CLAY. (TOPSOIL)	0.20	
				Brown CLAY. (WEATHERED COAL MEASURES)	(1.20)	
				Moderate to strong light brown medium grained SANDSTONE recovered as chippings. (COAL MEASURES)	1.40	
				Weak to moderate purplish grey SILTSTONE recovered as chippings. (COAL MEASURES)	(2.60)	
				Moderately strong dark grey MUDSTONE recovered as chippings. (COAL MEASURES)	4.00	
				Black COAL recovered as chippings. (SWALLOW WOOD SEAM)	(2.00)	
				Moderately strong dark grey MUDSTONE recovered as chippings. (COAL MEASURES)	6.00	
				Moderately strong dark grey MUDSTONE recovered as chippings. (COAL MEASURES)	(3.20)	
				Moderately strong dark grey MUDSTONE recovered as chippings. (COAL MEASURES)	9.20	
				Moderately strong dark grey MUDSTONE recovered as chippings. (COAL MEASURES)	9.90	
			Moderately strong dark grey MUDSTONE recovered as chippings. (COAL MEASURES)	(5.10)		
			Moderately strong dark grey MUDSTONE recovered as chippings. (COAL MEASURES)	15.00		
			Light grey SANDSTONE recovered as sand. (COAL MEASURES)	(1.00)		
				16.00		

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Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth		
15/07/20		9.20	-		9.20	1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Position drilled from surface. 3. Groundwater struck at 9.20m depth. 4. On completion, borehole backfilled with arisings.	
15/07/20	09:53	10.00	1.00	140	10.00		
15/07/20	10:13	10.00	1.00	140	7.30		
All dimensions in metres						Scale:	1:89
Method Used:	Rotary openhole drilling		Plant Used:	Massenza M-I-3		Drilled By:	CAPCSL
						Logged By:	ASHoward
						Checked By:	JH



BOREHOLE LOG

Contract: Birdwell		Client: Harworth Group		Borehole: BH101
Contract Ref: 350283	Start: 15.07.20 End: 15.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 2 of 2

Drilling Progress Log		Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	Drill Time (hh:mm)					
				Moderately strong dark grey MUDSTONE/SILTSTONE /SANDSTONE interbeds. (COAL MEASURES)	(12.00)	
				Light grey SANDSTONE. (COAL MEASURES)	(2.00)	
				Borehole terminated at 30.00m depth.	30.00	

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Drilling Progress and Water Observations						General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	

All dimensions in metres Scale: **1:89**

Method Used: Rotary openhole drilling	Plant Used: Massenza M-I-3	Drilled By: CAPCSL	Logged By: ASHoward	Checked By: JH	
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BOREHOLE LOG

Contract: Birdwell		Client: Harworth Group		Borehole: BH102
Contract Ref: 350283	Start: 15.07.20 End: 15.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Drilling Progress Log		Backfill & Instrumentation	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	Drill Time (hh:mm)					
				Grass over brown CLAY. (TOPSOIL)	0.20	
				Orangish brown CLAY. (WEATHERED COAL MEASURES)	(1.10)	
				Weak to moderate brown SANDSTONE recovered as chippings. (COAL MEASURES)	1.30	
				Weak to moderate grey MUDSTONE. (COAL MEASURES)	(2.80)	
				Weak to moderate grey MUDSTONE. (COAL MEASURES)	4.10	
				Black COAL. (SWALLOW WOOD COAL)	9.60	
				Black COAL. (SWALLOW WOOD COAL)	(0.90)	
				Grey MUDSTONE. (COAL MEASURES)	10.50	
				Grey MUDSTONE. (COAL MEASURES)	(1.50)	
				Borehole terminated at 12.00m depth.	12.00	

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Drilling Progress and Water Observations						General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	
						1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Position drilled from surface. 3. No groundwater encountered. 4. Monitoring well installed to 4.00m bgl; 1.00m plain pipe, 3.00m slotted pipe. Upstanding cover installed. 5. Borehole backfilled with arisings to 4.00m bgl, gravel to 1.00m bgl and bentonite seal from 1.00m bgl to ground level.
Method Used: Rotary openhole drilling				Plant Used: Massenza M-I-3	Drilled By: CAPSCL	All dimensions in metres Scale: 1:89 Logged By: ASHoward Checked By: JH





BOREHOLE LOG

Contract: Birdwell		Client: Harworth Group		Borehole: BH104
Contract Ref: 350283	Start: 15.07.20 End: 15.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Drilling Progress Log		Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	Drill Time (hh:mm)					
		1		Long grass over CLAY. (TOPSOIL)	0.30	
				Brown CLAY. (WEATHERED COAL MEASURES)	1.10	
				Orangish brown SANDSTONE recovered as chippings. (COAL MEASURES)	(3.10)	
				Grey MUDSTONE recovered as chippings. (COAL MEASURES)	4.20	
					(7.30)	
				Black COAL. (SWALLOW WOOD COAL)	11.50 (1.00)	
				Grey MUDSTONE. (COAL MEASURES)	12.50 (1.00)	
			Borehole terminated at 13.50m depth.	13.50		

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Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth		
						1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Position drilled from surface. 3. Groundwater struck at 12.50m depth. 4. On completion, borehole backfilled with arisings.	
						All dimensions in metres	Scale: 1:89
Method Used: Rotary openhole drilling	Plant Used: Massenza M-I-3		Drilled By: CAPSCL	Logged By: ASHoward	Checked By: JH		



BOREHOLE LOG

Contract: Birdwell		Client: Harworth Group		Borehole: BH105
Contract Ref: 350283	Start: 15.07.20 End: 15.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Drilling Progress Log		Backfill & Instrumentation	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	Drill Time (hh:mm)					
				Long grass over CLAY. (TILL)	0.20	
				Brown CLAY. (WEATHERED COAL MEASURES)	1.20	
				Light brown SANDSTONE. (COAL MEASURES)	3.20	
				Grey MUDSTONE. (COAL MEASURES)	4.40	
					8.40	
				Black COAL. (SWALLOW WOOD COAL)	12.80	
				Grey MUDSTONE. (COAL MEASURES)	13.70	
					15.00	
				Borehole terminated at 15.00m depth.		

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Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth		
						1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Position drilled from surface. 3. Groundwater struck at 7.50m depth. 4. Monitoring well installed to 6.00m bgl; 1.00m plain pipe, 5.00m slotted pipe. Upstanding cover installed. 5. Borehole backfilled with arisings to 6.00m bgl, gravel to 1.00m bgl and bentonite seal from 1.00m bgl to ground level.	
Method Used: Rotary openhole drilling						All dimensions in metres	
Plant Used: Massenza M-I-3						Scale: 1:89	
Drilled By: CAPCSL						Logged By: ASHoward	
						Checked By: JH	

BOREHOLE LOG

Contract: Birdwell		Client: Harworth Group		Borehole: BH106
Contract Ref: 350283	Start: 16.07.20 End: 16.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Drilling Progress Log		Backfill & Instrumentation	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	Drill Time (hh:mm)					
				Brown CLAY. (FOREMAN'S DESCRIPTION) (TOPSOIL)	(1.30)	
				Yellow / pale yellow SANDSTONE. (FOREMAN'S DESCRIPTION) (COAL MEASURES)	1.30 (3.20)	
				Grey MUDSTONE / SANDSTONE. (FOREMAN'S DESCRIPTION) (COAL MEASURES)	4.50 (6.80)	
				COAL. (FOREMAN'S DESCRIPTION) (SWALLOW WOOD COAL)	11.30 12.10	
				Grey MUDSTONE. (FOREMAN'S DESCRIPTION) (COAL MEASURES)	(1.40)	
				Borehole terminated at 13.5m depth.	13.50	

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Drilling Progress and Water Observations						General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	
						1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Position drilled from surface. 3. Groundwater struck at 11.00m depth. 4. Monitoring well installed to 6.00m bgl; 1.00m plain pipe, 5.00m slotted pipe. Upstanding cover installed. 5. Borehole backfilled with arisings to 6.00m bgl, gravel to 1.00m bgl and bentonite seal from 1.00m bgl to ground level.
All dimensions in metres						
Method Used:	Rotary openhole drilling		Plant Used:	Massenza M-I-3		Drilled By: CAPCSL Logged By: ASHoward Checked By: JH



BOREHOLE LOG

Contract: Birdwell		Client: Harworth Group		Borehole: BH107
Contract Ref: 350283	Start: 16.07.20 End: 16.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 2

Drilling Progress Log		Backfill & Instrumentation	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	Drill Time (hh:mm)					
				Brown / grey CLAY. (FOREMAN'S DESCRIPTION) (WEATHERED COAL MEASURES)	(2.00) 2.00	
				Yellow / pale yellow SANDSTONE. (FOREMAN'S DESCRIPTION) (COAL MEASURES)	(2.30) 4.30	
				Grey MUDSTONE / SANDSTONE. (FOREMAN'S DESCRIPTION) (COAL MEASURES)	(9.20) 13.50	
				COAL. (FOREMAN'S DESCRIPTION) (SWALLOW WOOD COAL)	(0.90) 14.40	
				Grey MUDSTONE. (FOREMAN'S DESCRIPTION) (COAL MEASURES)	(1.60) 16.00	

Borehole terminated at 16.00m depth.

Drilling Progress and Water Observations						General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	
						1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Position drilled from surface. 3. Groundwater struck at 7.50m depth. 4. Monitoring well installed to 8.00m bgl; 1.00m plain pipe, 7.00m slotted pipe. Upstanding cover installed. 5. Borehole backfilled with arisings to 8.00m bgl, gravel to 1.00m bgl and bentonite seal from 1.00m bgl to ground level.
All dimensions in metres						
Method Used: Rotary openhole drilling	Plant Used: Massenza M-I-3		Drilled By: CAPSCL	Logged By: ASHoward	Checked By: JH	

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BOREHOLE LOG

Contract: Birdwell		Client: Harworth Group		Borehole: BH107
Contract Ref: 350283	Start: 16.07.20 End: 16.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 2 of 2

Drilling Progress Log		Backfill & Instrumentation	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	Drill Time (hh:mm)					

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Drilling Progress and Water Observations						General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	

All dimensions in metres Scale: **1:89**

Method Used: Rotary openhole drilling	Plant Used: Massenza M-I-3	Drilled By: CAPSCL	Logged By: ASHoward	Checked By: JH	
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BOREHOLE LOG

Contract: Birdwell		Client: Harworth Group		Borehole: BH108
Contract Ref: 350283	Start: 16.07.20 End: 16.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Drilling Progress Log		Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend	
Depth	Drill Time (hh:mm)						
		Backfill		CLAY. (FOREMAN'S DESCRIPTION) (WEATHERED COAL MEASURES)	(1.50)		
				COAL. (FOREMAN'S DESCRIPTION) (SWALLOW WOOD COAL)	1.50 1.80		
				Yellow SANDSTONE. (FOREMAN'S DESCRIPTION) (COAL MEASURES)	(1.50) 3.30		
				Grey MUDSTONE. (FOREMAN'S DESCRIPTION) (COAL MEASURES)	(3.20) 6.50		
				COAL. (FOREMAN'S DESCRIPTION) (SWALLOW WOOD COAL)	6.80		
			Grey MUDSTONE. (FOREMAN'S DESCRIPTION) (COAL MEASURES)	(1.20) 8.00			
			Borehole terminated at 8.00m depth.				

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Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth		
						1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Position drilled from surface. 3. No groundwater encountered. 4. On completion, borehole backfilled with arisings.	
				All dimensions in metres		Scale:	1:89
Method Used:	Rotary openhole drilling		Plant Used:	Massenza M-I-3		Drilled By:	CAPCSL
						Logged By:	ASHoward
						Checked By:	J4



BOREHOLE LOG

Contract: Birdwell		Client: Harworth Group		Borehole: BH109
Contract Ref: 350283	Start: 16.07.20 End: 16.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Drilling Progress Log		Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	Drill Time (hh:mm)					
		Backfill		CLAY. (FOREMAN'S DESCRIPTION) (WEATHERED COAL MEASURES)	(1.80)	
				Yellow SANDSTONE. (FOREMAN'S DESCRIPTION) (COAL MEASURES)	2.50	
				COAL. (FOREMAN'S DESCRIPTION) (SWALLOW WOOD COAL)	3.00	
				Grey MUDSTONE. (FOREMAN'S DESCRIPTION) (COAL MEASURES)	(5.30)	
				COAL. (FOREMAN'S DESCRIPTION) (SWALLOW WOOD COAL)	8.30	
			Grey MUDSTONE. (FOREMAN'S DESCRIPTION) (COAL MEASURES)	8.50		
				(1.50)		
				10.00		
			Borehole terminated at 10.00m depth.			

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Drilling Progress and Water Observations						General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	
						1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Position drilled from surface. 3. No groundwater encountered. 4. On completion, borehole backfilled with arisings.
Method Used: Rotary openhole drilling			Plant Used: Massenza M-I-3		Drilled By: CAPCSL	All dimensions in metres Scale: 1:89 Logged By: ASHoward Checked By: JH





BOREHOLE LOG

Contract: Birdwell		Client: Harworth Group		Borehole: BH110
Contract Ref: 350283	Start: 16.07.20 End: 16.07.20	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Drilling Progress Log		Backfill & Instrumentation	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	Drill Time (hh:mm)					
				Brown / yellow CLAY. (FOREMAN'S DESCRIPTION) (WEATHERED COAL MEASURES)	(1.30) 1.30	
				Yellow SANDSTONE. (FOREMAN'S DESCRIPTION) (COAL MEASURES)	(3.50) 4.80	
				Grey MUDSTONE. (FOREMAN'S DESCRIPTION) (COAL MEASURES)	(1.60) 6.40	
				COAL. (FOREMAN'S DESCRIPTION) (SWALLOW WOOD COAL)	(1.30) 7.70	
				Grey MUDSTONE. (FOREMAN'S DESCRIPTION) (COAL MEASURES)	(4.30) 12.00	
				Borehole terminated at 12.00m depth.		

GINT LIBRARY_V10_01.GLB LibVersion: v8_07 | Log ROTARY OPENHOLE LOG - A4P | 350283 BIRDWELL.GPJ - v10_01.
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Drilling Progress and Water Observations						General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	
						1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Position drilled from surface. 3. No groundwater encountered. 4. Monitoring well installed to 5.00m bgl; 1.00m plain pipe, 4.00m slotted pipe. Upstanding cover installed. 5. Borehole backfilled with arisings to 5.00m bgl, gravel to 1.00m bgl and bentonite seal from 1.00m bgl to ground level.
				All dimensions in metres	Scale:	1:89
Method Used:	Rotary openhole drilling		Plant Used:	Massenza M-I-3		Drilled By: CAPCSL Logged By: AStanden-Howard Checked By:



APPENDIX I

GROUND GAS MONITORING DATA

IN-SITU GAS MONITORING RESULTS

Start Date	End Date	Pressures		Start	End	Equipment Used & Remarks
		Previous	During			
Round 1 22/07/2020	22/07/2020	-	Constant	1007	1007	Weather: Raining Ground: Dry Wind: Light Air Temp: 16°C Summary: Gas Round 1
Round 2 05/08/2020	05/08/2020	-	Fluctuating	994	992	Weather: Overcast Ground: Dry Wind: Light Air Temp: 17°C Summary: Gas Round 2
Round 3 27/08/2020	27/08/2020	-	Falling	994	992	Weather: Overcast Ground: Dry Wind: Light Air Temp: 17°C Summary: Gas Round 3

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
BH102	1	50	1	4.00	4.00	1.00 to 3.00	22/07/2020 09:45:00	1007	1007	0.0 _(l)	2.76	0.0	0.0	20.7	0	0
BH102	1	50	1	---	---	1.00 to 3.00	15 secs	-	-	0.0 _(SS)	-	3.2	0.0	19.6	4	1
BH102	1	50	1	---	---	1.00 to 3.00	30 secs	-	-	-	-	3.3	0.0	18.8	3	0
BH102	1	50	1	---	---	1.00 to 3.00	60 secs	-	-	-	-	3.3	0.0	18.7	4	0
BH102	1	50	1	---	---	1.00 to 3.00	90 secs	-	-	-	-	3.3	0.0	18.6	1	0
BH102	1	50	1	---	---	1.00 to 3.00	120 secs	-	-	-	-	3.3	0.0	18.6	3	0
BH102	1	50	1	---	---	1.00 to 3.00	180 secs	-	-	-	-	3.3	0.0	18.6	3	0
BH102	1	50	2	4.00	4.05	1.00 to 3.00	05/08/2020 10:15:00	993	993	0.0 _(l)	3.35	0.0	0.0	21.2	-	-
BH102	1	50	2	---	---	1.00 to 3.00	15 secs	-	-	0.0 _(SS)	-	2.0	0.0	19.9	-	-
BH102	1	50	2	---	---	1.00 to 3.00	30 secs	-	-	-	-	2.0	0.0	19.8	-	-
BH102	1	50	2	---	---	1.00 to 3.00	60 secs	-	-	-	-	2.0	0.0	19.8	-	-
BH102	1	50	2	---	---	1.00 to 3.00	90 secs	-	-	-	-	2.0	0.0	19.8	-	-
BH102	1	50	2	---	---	1.00 to 3.00	120 secs	-	-	-	-	2.0	0.0	19.8	-	-
BH102	1	50	2	---	---	1.00 to 3.00	180 secs	-	-	-	-	2.0	0.0	19.8	-	-
BH102	1	50	3	4.00	4.00	1.00 to 3.00	27/08/2020 09:30:00	992	992	0.0 _(l)	3.40	0.0	0.0	21.3	-	-
BH102	1	50	3	---	---	1.00 to 3.00	15 secs	-	-	0.0 _(SS)	-	0.0	0.0	21.4	-	-
BH102	1	50	3	---	---	1.00 to 3.00	30 secs	-	-	-	-	0.0	0.0	20.3	-	-
BH102	1	50	3	---	---	1.00 to 3.00	60 secs	-	-	-	-	0.0	0.0	20.5	-	-

Key: I = Initial, Min = Minimum, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

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IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
BH102	1	50	3		---	1.00 to 3.00	90 secs	-	-	-	-	0.0	0.0	20.7	-	-
BH102	1	50	3		---	1.00 to 3.00	120 secs	-	-	-	-	0.0	0.0	20.7	-	-
BH102	1	50	3		---	1.00 to 3.00	180 secs	-	-	-	-	0.0	0.0	20.7	-	-
BH105	1	50	1	6.00	5.90	1.00 to 5.00	22/07/2020 10:00:00	1007	1007	0.0 _(l)	2.70	0.0	0.0	21.2	4	0
BH105	1	50	1		---	1.00 to 5.00	15 secs	-	-	0.0 _(ss)	-	3.4	0.0	18.5	9	0
BH105	1	50	1		---	1.00 to 5.00	30 secs	-	-	-	-	3.4	0.0	17.8	6	0
BH105	1	50	1		---	1.00 to 5.00	60 secs	-	-	-	-	3.5	0.0	17.7	8	0
BH105	1	50	1		---	1.00 to 5.00	90 secs	-	-	-	-	3.5	0.0	17.6	6	0
BH105	1	50	1		---	1.00 to 5.00	120 secs	-	-	-	-	3.5	0.0	17.6	6	0
BH105	1	50	1		---	1.00 to 5.00	180 secs	-	-	-	-	3.5	0.0	17.6	6	0
BH105	1	50	2	6.00	5.90	1.00 to 5.00	05/08/2020 09:45:00	993	993	0.0 _(l)	2.85	0.1	0.0	21.2	-	-
BH105	1	50	2		---	1.00 to 5.00	15 secs	-	-	0.0 _(ss)	-	2.5	0.0	19.4	-	-
BH105	1	50	2		---	1.00 to 5.00	30 secs	-	-	-	-	3.0	0.0	19.0	-	-
BH105	1	50	2		---	1.00 to 5.00	60 secs	-	-	-	-	3.0	0.0	19.0	-	-
BH105	1	50	2		---	1.00 to 5.00	90 secs	-	-	-	-	3.0	0.0	19.0	-	-
BH105	1	50	2		---	1.00 to 5.00	120 secs	-	-	-	-	3.0	0.0	19.0	-	-
BH105	1	50	2		---	1.00 to 5.00	180 secs	-	-	-	-	3.0	0.0	19.0	-	-
BH105	1	50	3	6.00	6.00	1.00 to 5.00	27/08/2020 09:50:00	993	993	0.0 _(l)	2.80	0.0	0.0	21.0	-	-
BH105	1	50	3		---	1.00 to 5.00	15 secs	-	-	0.0 _(ss)	-	0.0	0.0	21.0	-	-
BH105	1	50	3		---	1.00 to 5.00	30 secs	-	-	-	-	0.0	0.0	20.7	-	-
BH105	1	50	3		---	1.00 to 5.00	60 secs	-	-	-	-	0.0	0.0	20.7	-	-
BH105	1	50	3		---	1.00 to 5.00	90 secs	-	-	-	-	0.0	0.0	20.7	-	-
BH105	1	50	3		---	1.00 to 5.00	120 secs	-	-	-	-	0.0	0.0	20.6	-	-
BH105	1	50	3		---	1.00 to 5.00	180 secs	-	-	-	-	0.0	0.0	20.6	-	-

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IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
BH106	1	50	1	6.00	4.80	1.00 to 5.00	22/07/2020 10:20:00	1007	1007	0.0 _(l)	3.40	0.1	0.0	21.2	1	0	
Remarks: Open tap																	
BH106	1	50	1		---	1.00 to 5.00	15 secs	-	-	0.0 _(SS)	-	2.6	0.0	19.0	8	0	
BH106	1	50	1		---	1.00 to 5.00	30 secs	-	-	-	-	2.6	0.0	18.6	3	0	
BH106	1	50	1		---	1.00 to 5.00	60 secs	-	-	-	-	2.7	0.0	18.5	3	0	
BH106	1	50	1		---	1.00 to 5.00	90 secs	-	-	-	-	2.7	0.0	18.6	3	0	
BH106	1	50	1		---	1.00 to 5.00	120 secs	-	-	-	-	2.6	0.0	18.6	3	0	
BH106	1	50	1		---	1.00 to 5.00	180 secs	-	-	-	-	2.6	0.0	18.6	3	0	
BH106	1	50	2	6.00	5.85	1.00 to 5.00	05/08/2020 09:30:00	993	993	0.0 _(l)	2.74	0.1	0.0	21.0	-	-	
BH106	1	50	2		---	1.00 to 5.00	15 secs	-	-	0.0 _(SS)	-	2.5	0.0	18.9	-	-	
BH106	1	50	2		---	1.00 to 5.00	30 secs	-	-	-	-	2.5	0.0	18.8	-	-	
BH106	1	50	2		---	1.00 to 5.00	60 secs	-	-	-	-	2.6	0.0	18.7	-	-	
BH106	1	50	2		---	1.00 to 5.00	90 secs	-	-	-	-	2.7	0.0	18.7	-	-	
BH106	1	50	2		---	1.00 to 5.00	120 secs	-	-	-	-	2.7	0.0	18.7	-	-	
BH106	1	50	2		---	1.00 to 5.00	180 secs	-	-	-	-	2.7	0.0	18.6	-	-	
BH106	1	50	3	6.00	5.80	1.00 to 5.00	27/08/2020 09:40:00	992	992	0.0 _(l)	3.10	0.0	0.0	21.3	-	-	
BH106	1	50	3		---	1.00 to 5.00	15 secs	-	-	0.0 _(SS)	-	0.0	0.0	21.0	-	-	
BH106	1	50	3		---	1.00 to 5.00	30 secs	-	-	-	-	0.0	0.0	20.8	-	-	
BH106	1	50	3		---	1.00 to 5.00	60 secs	-	-	-	-	0.0	0.0	20.8	-	-	
BH106	1	50	3		---	1.00 to 5.00	90 secs	-	-	-	-	0.0	0.0	20.7	-	-	
BH106	1	50	3		---	1.00 to 5.00	120 secs	-	-	-	-	0.0	0.0	20.7	-	-	
BH106	1	50	3		---	1.00 to 5.00	180 secs	-	-	-	-	0.0	0.0	20.7	-	-	
BH107	1	50	1	8.00	8.00	1.00 to 7.00	22/07/2020 09:50:00	1007	1007	0.0 _(l)	3.18	0.1	0.0	21.1	4	1	

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IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
			Remarks: Bung left off														
BH107	1	50	1		---	1.00 to 7.00	15 secs	-	-	0.0 _(SS)	-	0.4	0.0	20.8	3	0	
BH107	1	50	1		---	1.00 to 7.00	30 secs	-	-	-	-	0.7	0.0	20.4	3	0	
BH107	1	50	1		---	1.00 to 7.00	60 secs	-	-	-	-	0.9	0.0	20.0	3	0	
BH107	1	50	1		---	1.00 to 7.00	90 secs	-	-	-	-	1.0	0.0	19.7	3	0	
BH107	1	50	1		---	1.00 to 7.00	120 secs	-	-	-	-	1.1	0.0	19.5	3	0	
BH107	1	50	1		---	1.00 to 7.00	180 secs	-	-	-	-	1.1	0.0	19.5	3	0	
BH107	1	50	2	8.00	7.70	1.00 to 7.00	05/08/2020 09:15:00	993	993	0.0 _(l)	4.00	0.0	0.0	21.2	-	-	
BH107	1	50	2		---	1.00 to 7.00	15 secs	-	-	0.0 _(SS)	-	3.2	0.0	18.8	-	-	
BH107	1	50	2		---	1.00 to 7.00	30 secs	-	-	-	-	3.3	0.0	18.8	-	-	
BH107	1	50	2		---	1.00 to 7.00	60 secs	-	-	-	-	3.3	0.0	18.7	-	-	
BH107	1	50	2		---	1.00 to 7.00	90 secs	-	-	-	-	3.3	0.0	18.7	-	-	
BH107	1	50	2		---	1.00 to 7.00	120 secs	-	-	-	-	3.3	0.0	18.7	-	-	
BH107	1	50	2		---	1.00 to 7.00	180 secs	-	-	-	-	3.3	0.0	18.7	-	-	
BH107	1	50	3	8.00	7.70	1.00 to 7.00	27/08/2020 10:00:00	993	993	0.0 _(l)	2.90	0.0	0.0	21.1	-	-	
BH107	1	50	3		---	1.00 to 7.00	15 secs	-	-	0.0 _(SS)	-	0.0	0.0	20.8	-	-	
BH107	1	50	3		---	1.00 to 7.00	30 secs	-	-	-	-	0.0	0.0	20.7	-	-	
BH107	1	50	3		---	1.00 to 7.00	60 secs	-	-	-	-	0.0	0.0	20.6	-	-	
BH107	1	50	3		---	1.00 to 7.00	90 secs	-	-	-	-	0.0	0.0	20.6	-	-	
BH107	1	50	3		---	1.00 to 7.00	120 secs	-	-	-	-	0.0	0.0	20.6	-	-	
BH107	1	50	3		---	1.00 to 7.00	180 secs	-	-	-	-	0.0	0.0	20.6	-	-	
BH110	1	50	1	5.00	4.95	1.00 to 4.00	22/07/2020 10:30:00	1007	1007	0.0 _(l)	3.70	0.1	0.0	21.3	4	0	
BH110	1	50	1		---	1.00 to 4.00	15 secs	-	-	0.0 _(SS)	-	2.1	0.0	19.0	4	0	

Key: I = Initial, Min = Minimum, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

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IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
BH110	1	50	1		---	1.00 to 4.00	30 secs	-	-	-	-	2.1	0.0	18.9	3	0
BH110	1	50	1		---	1.00 to 4.00	60 secs	-	-	-	-	2.1	0.0	18.8	4	0
BH110	1	50	1		---	1.00 to 4.00	90 secs	-	-	-	-	2.1	0.0	18.8	4	0
BH110	1	50	1		---	1.00 to 4.00	120 secs	-	-	-	-	2.1	0.0	18.8	4	0
BH110	1	50	1		---	1.00 to 4.00	180 secs	-	-	-	-	2.1	0.0	18.8	4	0
BH110	1	50	2	5.00	4.95	1.00 to 4.00	05/08/2020 10:25:00	993	993	0.0 _(l)	3.76	0.1	0.0	21.3	-	-
BH110	1	50	2		---	1.00 to 4.00	15 secs	-	-	0.0 _(ss)	-	2.2	0.0	19.4	-	-
BH110	1	50	2		---	1.00 to 4.00	30 secs	-	-	-	-	2.2	0.0	19.2	-	-
BH110	1	50	2		---	1.00 to 4.00	60 secs	-	-	-	-	2.3	0.0	19.1	-	-
BH110	1	50	2		---	1.00 to 4.00	90 secs	-	-	-	-	2.3	0.0	19.0	-	-
BH110	1	50	2		---	1.00 to 4.00	120 secs	-	-	-	-	2.3	0.0	19.0	-	-
BH110	1	50	2		---	1.00 to 4.00	180 secs	-	-	-	-	2.3	0.0	19.0	-	-
BH110	1	50	3	5.00	4.95	1.00 to 4.00	27/08/2020 10:00:00	993	993	0.0 _(l)	2.95	0.0	0.0	21.1	-	-
BH110	1	50	3		---	1.00 to 4.00	15 secs	-	-	0.0 _(ss)	-	0.0	0.0	20.8	-	-
BH110	1	50	3		---	1.00 to 4.00	30 secs	-	-	-	-	0.0	0.0	20.7	-	-
BH110	1	50	3		---	1.00 to 4.00	60 secs	-	-	-	-	0.0	0.0	20.6	-	-
BH110	1	50	3		---	1.00 to 4.00	90 secs	-	-	-	-	0.0	0.0	20.6	-	-
BH110	1	50	3		---	1.00 to 4.00	120 secs	-	-	-	-	0.0	0.0	20.7	-	-
BH110	1	50	3		---	1.00 to 4.00	180 secs	-	-	-	-	0.0	0.0	20.7	-	-
WS101	1	50	1	1.50	1.50	0.50 to 1.50	22/07/2020 09:30:00	1007	1007	0.0 _(l)	DRY	0.0	0.0	21.2	0	0
WS101	1	50	1		---	0.50 to 1.50	15 secs	-	-	0.0 _(ss)	-	3.2	0.0	16.0	19	2
WS101	1	50	1		---	0.50 to 1.50	30 secs	-	-	-	-	3.3	0.0	15.1	19	2
WS101	1	50	1		---	0.50 to 1.50	60 secs	-	-	-	-	3.3	0.0	14.8	19	2
WS101	1	50	1		---	0.50 to 1.50	90 secs	-	-	-	-	3.3	0.0	14.8	19	2




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IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS101	1	50	1		---	0.50 to 1.50	120 secs	-	-	-	-	3.3	0.0	14.8	19	2
WS101	1	50	1		---	0.50 to 1.50	180 secs	-	-	-	-	3.3	0.0	14.8	19	2
WS101	1	50	2	1.50	1.50	0.50 to 1.50	05/08/2020 09:15:00	994	994	0.0 _(l)	DRY	0.1	0.0	20.7	-	-
WS101	1	50	2		---	0.50 to 1.50	15 secs	-	-	0.0 _(ss)	-	3.6	0.0	16.9	-	-
WS101	1	50	2		---	0.50 to 1.50	30 secs	-	-	-	-	3.6	0.0	16.6	-	-
WS101	1	50	2		---	0.50 to 1.50	60 secs	-	-	-	-	3.6	0.0	16.4	-	-
WS101	1	50	2		---	0.50 to 1.50	90 secs	-	-	-	-	3.7	0.0	16.4	-	-
WS101	1	50	2		---	0.50 to 1.50	120 secs	-	-	-	-	3.7	0.0	16.4	-	-
WS101	1	50	2		---	0.50 to 1.50	180 secs	-	-	-	-	3.7	0.0	16.4	-	-
WS101	1	50	3	1.50	1.48	0.50 to 1.50	27/08/2020 10:10:00	994	994	0.0 _(l)	DRY	0.0	0.0	21.3	-	-
WS101	1	50	3		---	0.50 to 1.50	15 secs	-	-	0.0 _(ss)	-	0.0	0.0	20.7	-	-
WS101	1	50	3		---	0.50 to 1.50	30 secs	-	-	-	-	0.0	0.0	20.7	-	-
WS101	1	50	3		---	0.50 to 1.50	60 secs	-	-	-	-	0.0	0.0	20.7	-	-
WS101	1	50	3		---	0.50 to 1.50	90 secs	-	-	-	-	0.0	0.0	20.7	-	-
WS101	1	50	3		---	0.50 to 1.50	120 secs	-	-	-	-	0.0	0.0	20.7	-	-
WS101	1	50	3		---	0.50 to 1.50	180 secs	-	-	-	-	0.0	0.0	20.7	-	-
WS103	1	50	1	1.50	1.50	0.50 to 1.50	22/07/2020 10:40:00	1007	1007	0.0 _(l)	DRY	0.1	0.0	21.1	3	0
Remarks: Tap open, wet at base																
WS103	1	50	1		---	0.50 to 1.50	15 secs	-	-	0.0 _(ss)	-	1.5	0.0	19.7	3	0
WS103	1	50	1		---	0.50 to 1.50	30 secs	-	-	-	-	1.5	0.0	19.2	3	0
WS103	1	50	1		---	0.50 to 1.50	60 secs	-	-	-	-	1.5	0.0	19.1	4	0
WS103	1	50	1		---	0.50 to 1.50	90 secs	-	-	-	-	1.6	0.0	19.0	3	0
WS103	1	50	1		---	0.50 to 1.50	120 secs	-	-	-	-	1.6	0.0	19.0	4	0
WS103	1	50	1		---	0.50 to 1.50	180 secs	-	-	-	-	1.6	0.0	19.0	3	0




Key: I = Initial, Min = Minimum, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

 RSK Environment Ltd The Potteries Pottery Street Castleford W. Yorkshire WF10 1NJ	Contract:  Compiled By	Date 07/09/20	Checked By	Date	Contract Ref: 350283
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IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS103	1	50	2	1.50	1.50	0.50 to 1.50	05/08/2020 10:00:00	993	993	0.0 _(l)	DRY	0.1	0.0	21.2	-	-
WS103	1	50	2	---	---	0.50 to 1.50	15 secs	-	-	0.0 _(SS)	-	2.2	0.0	19.9	-	-
WS103	1	50	2	---	---	0.50 to 1.50	30 secs	-	-	-	-	2.2	0.0	19.8	-	-
WS103	1	50	2	---	---	0.50 to 1.50	60 secs	-	-	-	-	2.2	0.0	19.8	-	-
WS103	1	50	2	---	---	0.50 to 1.50	90 secs	-	-	-	-	2.2	0.0	19.8	-	-
WS103	1	50	2	---	---	0.50 to 1.50	120 secs	-	-	-	-	2.2	0.0	19.8	-	-
WS103	1	50	2	---	---	0.50 to 1.50	180 secs	-	-	-	-	2.2	0.0	19.8	-	-
WS103	1	50	3	1.50	1.50	0.50 to 1.50	27/08/2020 09:40:00	993	993	0.0 _(l)	DRY	0.0	0.0	21.4	-	-
WS103	1	50	3	---	---	0.50 to 1.50	15 secs	-	-	0.0 _(SS)	-	0.0	0.0	21.0	-	-
WS103	1	50	3	---	---	0.50 to 1.50	30 secs	-	-	-	-	0.0	0.0	20.7	-	-
WS103	1	50	3	---	---	0.50 to 1.50	60 secs	-	-	-	-	0.0	0.0	20.7	-	-
WS103	1	50	3	---	---	0.50 to 1.50	90 secs	-	-	-	-	0.0	0.0	20.6	-	-
WS103	1	50	3	---	---	0.50 to 1.50	120 secs	-	-	-	-	0.0	0.0	20.6	-	-
WS103	1	50	3	---	---	0.50 to 1.50	180 secs	-	-	-	-	0.0	0.0	20.7	-	-
WS105	1	50	1	3.00	3.00	1.00 to 3.00	22/07/2020 10:40:00	1007	1007	0.0 _(l)	DRY	0.0	0.0	21.3	1	1
WS105	1	50	1	---	---	1.00 to 3.00	15 secs	-	-	0.0 _(SS)	-	1.6	0.0	19.1	1	0
WS105	1	50	1	---	---	1.00 to 3.00	30 secs	-	-	-	-	1.7	0.0	18.9	1	0
WS105	1	50	1	---	---	1.00 to 3.00	60 secs	-	-	-	-	1.7	0.0	18.8	1	0
WS105	1	50	1	---	---	1.00 to 3.00	90 secs	-	-	-	-	1.8	0.0	18.7	3	1
WS105	1	50	1	---	---	1.00 to 3.00	120 secs	-	-	-	-	1.7	0.0	18.7	1	0
WS105	1	50	1	---	---	1.00 to 3.00	180 secs	-	-	-	-	1.7	0.0	18.7	1	0
WS105	1	50	2	3.00	3.00	1.00 to 3.00	05/08/2020 10:45:00	992	992	0.0 _(l)	3.07	0.0	0.0	21.1	-	-
WS105	1	50	2	---	---	1.00 to 3.00	15 secs	-	-	0.0 _(SS)	-	2.7	0.0	18.4	-	-



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IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS105	1	50	2		---	1.00 to 3.00	30 secs	-	-	-	-	2.7	0.0	18.0	-	-
WS105	1	50	2		---	1.00 to 3.00	60 secs	-	-	-	-	2.8	0.0	17.0	-	-
WS105	1	50	2		---	1.00 to 3.00	90 secs	-	-	-	-	2.9	0.0	17.8	-	-
WS105	1	50	2		---	1.00 to 3.00	120 secs	-	-	-	-	2.9	0.0	17.8	-	-
WS105	1	50	2		---	1.00 to 3.00	180 secs	-	-	-	-	2.9	0.0	17.8	-	-
WS105	1	50	3	3.00	3.00	1.00 to 3.00	27/08/2020 09:30:00	992	992	0.0 _(l)	2.80	0.0	0.0	20.3	-	-
WS105	1	50	3		---	1.00 to 3.00	15 secs	-	-	0.0 _(ss)	-	0.0	0.0	20.7	-	-
WS105	1	50	3		---	1.00 to 3.00	30 secs	-	-	-	-	0.0	0.0	20.7	-	-
WS105	1	50	3		---	1.00 to 3.00	60 secs	-	-	-	-	0.0	0.0	20.7	-	-
WS105	1	50	3		---	1.00 to 3.00	90 secs	-	-	-	-	0.0	0.0	20.7	-	-
WS105	1	50	3		---	1.00 to 3.00	120 secs	-	-	-	-	0.0	0.0	20.8	-	-
WS105	1	50	3		---	1.00 to 3.00	180 secs	-	-	-	-	0.0	0.0	20.8	-	-
WS107	1	50	1	1.50	1.40	0.50 to 1.50	22/07/2020 10:40:00	1007	1007	0.0 _(l)	DRY	0.0	0.0	21.3	1	1
WS107	1	50	1		---	0.50 to 1.50	15 secs	-	-	0.0 _(ss)	-	0.2	0.0	21.1	3	0
WS107	1	50	1		---	0.50 to 1.50	30 secs	-	-	-	-	0.3	0.0	20.7	3	0
WS107	1	50	1		---	0.50 to 1.50	60 secs	-	-	-	-	0.5	0.0	20.1	1	0
WS107	1	50	1		---	0.50 to 1.50	90 secs	-	-	-	-	0.6	0.0	20.0	1	0
WS107	1	50	1		---	0.50 to 1.50	120 secs	-	-	-	-	0.6	0.0	20.1	1	0
WS107	1	50	1		---	0.50 to 1.50	180 secs	-	-	-	-	0.6	0.0	20.1	1	0
WS107	1	50	2	1.50	1.45	0.50 to 1.50	05/08/2020 10:45:00	992	992	0.0 _(l)	DRY	0.1	0.0	21.0	-	-
WS107	1	50	2		---	0.50 to 1.50	15 secs	-	-	0.0 _(ss)	-	3.2	0.0	17.6	17	-
WS107	1	50	2		---	0.50 to 1.50	30 secs	-	-	-	-	3.3	0.0	17.3	4	-
WS107	1	50	2		---	0.50 to 1.50	60 secs	-	-	-	-	3.3	0.0	17.3	1	-



Key: I = Initial, Min = Minimum, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

 <p>RSK Environment Ltd The Potteries Pottery Street Castleford W. Yorkshire WF10 1NJ</p>	 Contract:	Compiled By Date 07/09/20	Checked By Date	Contract Ref: 350283
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IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
WS107	1	50	2		---	0.50 to 1.50	90 secs	-	-	-	-	3.4	0.0	17.2	3	-	
WS107	1	50	2		---	0.50 to 1.50	120 secs	-	-	-	-	3.4	0.0	17.2	3	-	
WS107	1	50	2		---	0.50 to 1.50	180 secs	-	-	-	-	3.4	0.0	17.2	3	-	
WS107	1	50	3	1.50	1.40	0.50 to 1.50	27/08/2020 09:20:00	993	993	0.0 _(l)	1.00	0.0	0.0	21.3	-	-	
WS107	1	50	3		---	0.50 to 1.50	15 secs	-	-	0.0 _(SS)	-	0.0	0.0	21.2	-	-	
WS107	1	50	3		---	0.50 to 1.50	30 secs	-	-	-	-	0.0	0.0	21.1	-	-	
WS107	1	50	3		---	0.50 to 1.50	60 secs	-	-	-	-	0.0	0.0	20.8	-	-	
WS107	1	50	3		---	0.50 to 1.50	90 secs	-	-	-	-	0.0	0.0	20.8	-	-	
WS107	1	50	3		---	0.50 to 1.50	120 secs	-	-	-	-	0.0	0.0	20.9	-	-	
WS107	1	50	3		---	0.50 to 1.50	180 secs	-	-	-	-	0.0	0.0	20.9	-	-	
WS110	1	50	1	1.50	1.40	0.50 to 1.50	22/07/2020 10:10:00	1007	1007	0.0 _(l)	DRY	0.1	0.0	20.9	6	1	
Remarks: Open tap																	
WS110	1	50	1		---	0.50 to 1.50	15 secs	-	-	0.0 _(SS)	-	1.5	0.0	19.8	4	0	
WS110	1	50	1		---	0.50 to 1.50	30 secs	-	-	-	-	1.5	0.0	19.5	3	0	
WS110	1	50	1		---	0.50 to 1.50	60 secs	-	-	-	-	1.6	0.0	19.4	4	0	
WS110	1	50	1		---	0.50 to 1.50	90 secs	-	-	-	-	1.7	0.0	19.3	3	0	
WS110	1	50	1		---	0.50 to 1.50	120 secs	-	-	-	-	1.8	0.0	19.0	3	0	
WS110	1	50	1		---	0.50 to 1.50	180 secs	-	-	-	-	1.8	0.0	19.0	3	0	
WS110	1	50	2	1.50	1.40	0.50 to 1.50	05/08/2020 10:45:00	992	992	0.0 _(l)	DRY	0.1	0.0	20.8	-	-	
WS110	1	50	2		---	0.50 to 1.50	15 secs	-	-	0.0 _(SS)	-	0.5	0.0	19.5	-	-	
WS110	1	50	2		---	0.50 to 1.50	30 secs	-	-	-	-	0.5	0.0	19.3	-	-	
WS110	1	50	2		---	0.50 to 1.50	60 secs	-	-	-	-	0.5	0.0	19.2	-	-	
WS110	1	50	2		---	0.50 to 1.50	90 secs	-	-	-	-	0.5	0.0	19.2	-	-	
WS110	1	50	2		---	0.50 to 1.50	120 secs	-	-	-	-	0.5	0.0	19.2	-	-	

Key: I = Initial, Min = Minimum, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

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IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS110	1	50	2		---	0.50 to 1.50	180 secs	-	-	-	-	0.5	0.0	19.2	-	-
WS110	1	50	3	1.50	1.40	0.50 to 1.50	27/08/2020 09:10:00	994	994	0.0 _(l)	0.34	0.0	0.0	21.2	-	-
WS110	1	50	3		---	0.50 to 1.50	15 secs	-	-	0.0 _(SS)	-	0.0	0.0	21.2	-	-
WS110	1	50	3		---	0.50 to 1.50	30 secs	-	-	-	-	0.0	0.0	21.0	-	-
WS110	1	50	3		---	0.50 to 1.50	60 secs	-	-	-	-	0.0	0.0	20.9	-	-
WS110	1	50	3		---	0.50 to 1.50	90 secs	-	-	-	-	0.0	0.0	20.9	-	-
WS110	1	50	3		---	0.50 to 1.50	120 secs	-	-	-	-	0.0	0.0	20.9	-	-
WS110	1	50	3		---	0.50 to 1.50	180 secs	-	-	-	-	0.0	0.0	20.9	-	-
WS111	1	50	1	1.50	1.50	0.50 to 1.50	22/07/2020 10:55:00	1007	1007	0.0 _(l)	DRY	0.1	0.0	21.3	3	1
Remarks: Tap left open																
WS111	1	50	1		---	0.50 to 1.50	15 secs	-	-	0.0 _(SS)	-	2.3	0.0	17.8	3	0
WS111	1	50	1		---	0.50 to 1.50	30 secs	-	-	-	-	2.3	0.0	17.6	3	0
WS111	1	50	1		---	0.50 to 1.50	60 secs	-	-	-	-	2.3	0.0	17.5	3	0
WS111	1	50	1		---	0.50 to 1.50	90 secs	-	-	-	-	2.3	0.0	17.4	3	0
WS111	1	50	1		---	0.50 to 1.50	120 secs	-	-	-	-	2.2	0.0	17.4	3	0
WS111	1	50	1		---	0.50 to 1.50	180 secs	-	-	-	-	2.2	0.0	17.4	3	0
WS111	1	50	2	1.50	1.45	0.50 to 1.50	05/08/2020 10:35:00	992	992	0.0 _(l)	1.00	0.1	0.0	21.2	-	-
WS111	1	50	2		---	0.50 to 1.50	15 secs	-	-	0.0 _(SS)	-	1.9	0.0	19.7	-	-
WS111	1	50	2		---	0.50 to 1.50	30 secs	-	-	-	-	1.9	0.0	19.4	-	-
WS111	1	50	2		---	0.50 to 1.50	60 secs	-	-	-	-	1.9	0.0	19.4	-	-
WS111	1	50	2		---	0.50 to 1.50	90 secs	-	-	-	-	2.0	0.0	19.3	-	-
WS111	1	50	2		---	0.50 to 1.50	120 secs	-	-	-	-	2.0	0.0	19.3	-	-
WS111	1	50	2		---	0.50 to 1.50	180 secs	-	-	-	-	2.0	0.0	19.3	-	-
WS111	1	50	3	1.50	1.50	0.50 to 1.50	27/08/2020 09:20:00	994	994	0.0 _(l)	DRY	0.0	0.0	21.4	-	-

Key: I = Initial, Min = Minimum, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

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IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS111	1	50	3	---	---	0.50 to 1.50	15 secs	-	-	0.0 _(SS)	-	0.0	0.0	20.9	-	-
WS111	1	50	3	---	---	0.50 to 1.50	30 secs	-	-	-	-	0.0	0.0	20.9	-	-
WS111	1	50	3	---	---	0.50 to 1.50	60 secs	-	-	-	-	0.0	0.0	20.9	-	-
WS111	1	50	3	---	---	0.50 to 1.50	90 secs	-	-	-	-	0.0	0.0	20.8	-	-
WS111	1	50	3	---	---	0.50 to 1.50	120 secs	-	-	-	-	0.0	0.0	20.8	-	-
WS111	1	50	3	---	---	0.50 to 1.50	180 secs	-	-	-	-	0.0	0.0	20.8	-	-

Key: I = Initial, Min = Minimum, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

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APPENDIX J LABORATORY CERTIFICATES FOR SOIL ANALYSIS

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 20/01041
Issue Number: 1
Date: 12 February, 2020

Client: RSK Environment Ltd Castleford
The Potteries
Pottery Street
Castleford
WF10 1NJ

Project Manager: Laura Alderman
Project Name: Birdwell, Barnsley
Project Ref: 350283
Order No: N/A
Date Samples Received: 03/02/20
Date Instructions Received: 03/02/20
Date Analysis Completed: 12/02/20

Prepared by:


Melanie Marshall
Laboratory Coordinator

Approved by:


Iain Haslock
Analytical Consultant

Envirolab Job Number: 20/01041

Client Project Name: Birdwell, Barnsley

Client Project Ref: 350283

Lab Sample ID	20/01041/1	20/01041/4	20/01041/5	20/01041/6	20/01041/7	20/01041/9	20/01041/10	Units	Limit of Detection	Method ref
Client Sample No	1	2	1	1	2	2	1			
Client Sample ID	TP01	TP02	TP03	TP04	TP04	TP05	TP06			
Depth to Top	0.10	0.30	0.30	0.30	2.00	1.00	0.10			
Depth To Bottom										
Date Sampled	29-Jan-20	29-Jan-20	29-Jan-20	29-Jan-20	29-Jan-20	29-Jan-20	30-Jan-20			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	6AE	6AE	6AE	6AE	6AE	4A	4AE			
% Stones >10mm _A	<0.1	2.2	<0.1	3.1	0.9	11.9	<0.1			
pH _D ^{M#}	6.28	-	6.48	5.51	5.38	-	6.25	pH	0.01	A-T-031s
pH BRE _D ^{M#}	-	6.47	6.48	-	5.38	6.98	-	pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	<0.01	-	-	<0.01	-	-	0.04	g/l	0.01	A-T-026s
Sulphate BRE (water sol 2:1) _D ^{M#}	-	<10	<10	-	27	<10	-	mg/l	10	A-T-026s
Sulphate (acid soluble) _D ^{M#}	690	-	-	540	-	-	1200	mg/kg	200	A-T-028s
Sulphate BRE (acid sol) _D ^{M#}	-	0.05	0.06	-	0.03	<0.02	-	% w/w	0.02	A-T-028s
Sulphur BRE (total) _D	-	0.02	0.03	-	<0.01	<0.01	-	% w/w	0.01	A-T-024s
Organic matter _D ^{M#}	11.5	-	3.0	5.8	-	-	9.9	% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	11	-	3	9	6	-	11	mg/kg	1	A-T-024s
Cadmium _D ^{M#}	1.0	-	1.1	1.1	1.1	-	0.8	mg/kg	0.5	A-T-024s
Copper _D ^{M#}	25	-	8	66	19	-	23	mg/kg	1	A-T-024s
Chromium _D ^{M#}	23	-	28	20	24	-	25	mg/kg	1	A-T-024s
Lead _D ^{M#}	54	-	27	51	16	-	69	mg/kg	1	A-T-024s
Mercury _D	<0.17	-	<0.17	<0.17	<0.17	-	0.19	mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	22	-	42	26	35	-	16	mg/kg	1	A-T-024s
Selenium _D ^{M#}	2	-	5	<1	<1	-	2	mg/kg	1	A-T-024s
Zinc _D ^{M#}	106	-	96	166	68	-	105	mg/kg	5	A-T-024s

Envirolab Job Number: 20/01041

Client Project Name: Birdwell, Barnsley

Client Project Ref: 350283

Lab Sample ID	20/01041/1	20/01041/4	20/01041/5	20/01041/6	20/01041/7	20/01041/9	20/01041/10	Units	Limit of Detection	Method ref
Client Sample No	1	2	1	1	2	2	1			
Client Sample ID	TP01	TP02	TP03	TP04	TP04	TP05	TP06			
Depth to Top	0.10	0.30	0.30	0.30	2.00	1.00	0.10			
Depth To Bottom										
Date Sampled	29-Jan-20	29-Jan-20	29-Jan-20	29-Jan-20	29-Jan-20	29-Jan-20	30-Jan-20			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	6AE	6AE	6AE	6AE	6AE	4A	4AE			
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	-	-	NAD	-	-	NAD	A-T-045		
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	-	-	N/A	-	-	N/A	A-T-045		

Envirolab Job Number: 20/01041

Client Project Name: Birdwell, Barnsley

Client Project Ref: 350283

Lab Sample ID	20/01041/1	20/01041/4	20/01041/5	20/01041/6	20/01041/7	20/01041/9	20/01041/10	Units	Limit of Detection	Method ref
Client Sample No	1	2	1	1	2	2	1			
Client Sample ID	TP01	TP02	TP03	TP04	TP04	TP05	TP06			
Depth to Top	0.10	0.30	0.30	0.30	2.00	1.00	0.10			
Depth To Bottom										
Date Sampled	29-Jan-20	29-Jan-20	29-Jan-20	29-Jan-20	29-Jan-20	29-Jan-20	30-Jan-20			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	6AE	6AE	6AE	6AE	6AE	4A	4AE			
PAH-16MS										
Acenaphthene _A ^{M#}	0.01	-	<0.01	0.02	<0.01	-	<0.01	mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	-	<0.01	0.02	<0.01	-	<0.01	mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.04	-	<0.02	0.07	<0.02	-	<0.02	mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.19	-	<0.04	0.39	<0.04	-	<0.04	mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.16	-	<0.04	0.31	<0.04	-	<0.04	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	0.23	-	<0.05	0.40	<0.05	-	<0.05	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.09	-	<0.05	0.14	<0.05	-	<0.05	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	-	<0.07	0.15	<0.07	-	<0.07	mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	0.23	-	<0.06	0.43	<0.06	-	<0.06	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	-	<0.04	<0.04	<0.04	-	<0.04	mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	0.36	-	<0.08	0.79	<0.08	-	<0.08	mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	<0.01	-	<0.01	0.02	<0.01	-	<0.01	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.10	-	<0.03	0.18	<0.03	-	<0.03	mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	-	<0.03	<0.03	<0.03	-	<0.03	mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	0.19	-	<0.03	0.41	<0.03	-	<0.03	mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	0.31	-	<0.07	0.69	<0.07	-	<0.07	mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	1.91	-	<0.08	4.02	<0.08	-	<0.08	mg/kg	0.01	A-T-019s

Envirolab Job Number: 20/01041

Client Project Name: Birdwell, Barnsley

Client Project Ref: 350283

Lab Sample ID	20/01041/1	20/01041/4	20/01041/5	20/01041/6	20/01041/7	20/01041/9	20/01041/10	Units	Limit of Detection	Method ref
Client Sample No	1	2	1	1	2	2	1			
Client Sample ID	TP01	TP02	TP03	TP04	TP04	TP05	TP06			
Depth to Top	0.10	0.30	0.30	0.30	2.00	1.00	0.10			
Depth To Bottom										
Date Sampled	29-Jan-20	29-Jan-20	29-Jan-20	29-Jan-20	29-Jan-20	29-Jan-20	30-Jan-20			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	6AE	6AE	6AE	6AE	6AE	4A	4AE			
TPH CWG										
Ali >C5-C6 _A [#]	<0.01	-	-	<0.01	-	-	<0.01	mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	<0.01	-	-	<0.01	-	-	<0.01	mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<1	-	-	<1	-	-	<1	mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<1	-	-	<1	-	-	<1	mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	<1	-	-	<1	-	-	<1	mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	<1	-	-	<1	-	-	<1	mg/kg	1	A-T-055s
Ali >C21-C35 _A	8	-	-	5	-	-	9	mg/kg	1	A-T-055s
Total Aliphatics _A	8	-	-	5	-	-	9	mg/kg	1	A-T-055s
Aro >C5-C7 _A [#]	<0.01	-	-	<0.01	-	-	<0.01	mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	-	-	<0.01	-	-	<0.01	mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<1	-	-	<1	-	-	<1	mg/kg	1	A-T-055s
Aro >C10-C12 _A ^{M#}	<1	-	-	<1	-	-	<1	mg/kg	1	A-T-055s
Aro >C12-C16 _A	3	-	-	2	-	-	<1	mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	8	-	-	11	-	-	3	mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	50	-	-	29	-	-	16	mg/kg	1	A-T-055s
Total Aromatics _A	59	-	-	42	-	-	19	mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35) _A	67	-	-	47	-	-	28	mg/kg	1	A-T-055s
BTEX - Benzene _A [#]	<0.01	-	-	<0.01	-	-	<0.01	mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	-	-	<0.01	-	-	<0.01	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	-	-	<0.01	-	-	<0.01	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	-	-	<0.01	-	-	<0.01	mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	-	-	<0.01	-	-	<0.01	mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	-	-	<0.01	-	-	<0.01	mg/kg	0.01	A-T-022s

Envirolab Job Number: 20/01041

Client Project Name: Birdwell, Barnsley

Client Project Ref: 350283

Lab Sample ID	20/01041/11	20/01041/13	20/01041/14	20/01041/15				Units	Limit of Detection	Method ref
Client Sample No	2	2	1	2						
Client Sample ID	TP06	TP07	TP08	TP08						
Depth to Top	0.60	1.20	0.50	1.20						
Depth To Bottom										
Date Sampled	30-Jan-20	30-Jan-20	30-Jan-20	30-Jan-20						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	6AE	6AE	6AE	6AE						
% Stones >10mm _A	<0.1	<0.1	6.4	<0.1						
pH _D ^{M#}	-	-	6.46	5.39				pH	0.01	A-T-031s
pH BRE _D ^{M#}	6.75	6.63	-	-				pH	0.01	A-T-031s
Sulphate BRE (water sol 2:1) _D ^{M#}	73	47	-	-				mg/l	10	A-T-026s
Sulphate BRE (acid sol) _D ^{M#}	0.04	<0.02	-	-				% w/w	0.02	A-T-028s
Sulphur BRE (total) _D	0.02	<0.01	-	-				% w/w	0.01	A-T-024s
Arsenic _D ^{M#}	-	-	13	7				mg/kg	1	A-T-024s
Cadmium _D ^{M#}	-	-	0.7	0.8				mg/kg	0.5	A-T-024s
Copper _D ^{M#}	-	-	23	21				mg/kg	1	A-T-024s
Chromium _D ^{M#}	-	-	19	26				mg/kg	1	A-T-024s
Lead _D ^{M#}	-	-	42	12				mg/kg	1	A-T-024s
Mercury _D	-	-	<0.17	<0.17				mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	-	-	21	27				mg/kg	1	A-T-024s
Selenium _D ^{M#}	-	-	<1	<1				mg/kg	1	A-T-024s
Zinc _D ^{M#}	-	-	81	71				mg/kg	5	A-T-024s

Envirolab Job Number: 20/01041

Client Project Name: Birdwell, Barnsley

Client Project Ref: 350283

Lab Sample ID	20/01041/11	20/01041/13	20/01041/14	20/01041/15				Units	Limit of Detection	Method ref
Client Sample No	2	2	1	2						
Client Sample ID	TP06	TP07	TP08	TP08						
Depth to Top	0.60	1.20	0.50	1.20						
Depth To Bottom										
Date Sampled	30-Jan-20	30-Jan-20	30-Jan-20	30-Jan-20						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	6AE	6AE	6AE	6AE						
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	-	-	NAD	-				A-T-045		
Asbestos ACM - Suitable for Water Absorption Test? _D	-	-	N/A	-				A-T-045		

Envirolab Job Number: 20/01041

Client Project Name: Birdwell, Barnsley

Client Project Ref: 350283

Lab Sample ID	20/01041/11	20/01041/13	20/01041/14	20/01041/15				Units	Limit of Detection	Method ref
Client Sample No	2	2	1	2						
Client Sample ID	TP06	TP07	TP08	TP08						
Depth to Top	0.60	1.20	0.50	1.20						
Depth To Bottom										
Date Sampled	30-Jan-20	30-Jan-20	30-Jan-20	30-Jan-20						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	6AE	6AE	6AE	6AE						
PAH-16MS										
Acenaphthene _A ^{M#}	-	-	<0.01	<0.01				mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	-	-	<0.01	<0.01				mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	-	-	<0.02	<0.02				mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	-	-	<0.04	<0.04				mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	-	-	<0.04	<0.04				mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	-	-	<0.05	<0.05				mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	-	-	<0.05	<0.05				mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	-	-	<0.07	<0.07				mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	-	-	<0.06	<0.06				mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	-	-	<0.04	<0.04				mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	-	-	<0.08	<0.08				mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	-	-	<0.01	<0.01				mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	-	-	<0.03	<0.03				mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	-	-	<0.03	<0.03				mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	-	-	<0.03	<0.03				mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	-	-	<0.07	<0.07				mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	-	-	<0.08	<0.08				mg/kg	0.01	A-T-019s

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 20/05956
Issue Number: 1
Date: 29 July, 2020

Client: RSK Environment Ltd Castleford
The Potteries
Pottery Street
Castleford
WF10 1NJ

Project Manager: John Harrison
Project Name: Birdwell
Project Ref: 350258
Order No: N/A
Date Samples Received: 17/07/20
Date Instructions Received: 22/07/20
Date Analysis Completed: 28/07/20

Prepared by:



Danielle Brierley
Client Manager

Approved by:



Sophie France
Client Service Manager

Envirolab Job Number: 20/05956

Client Project Name: Birdwell

Client Project Ref: 350258

Lab Sample ID	20/05956/1	20/05956/2	20/05956/3	20/05956/4	20/05956/5			Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	AS1	AS2	AS3	AS4	AS5					
Depth to Top	0.00	0.00	0.00	0.00	0.00					
Depth To Bottom	0.05	0.05	0.05	0.05	0.05					
Date Sampled	17-Jul-20	17-Jul-20	17-Jul-20	17-Jul-20	17-Jul-20					
Sample Type	Soil	Soil	Soil	Soil	Soil					
Sample Matrix Code	6AE	6AE	6AE	6ABE	6AE					
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	NAD	NAD	NAD			A-T-045		
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	N/A	N/A			A-T-045		

REPORT NOTES

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Analytical results reflect the quality of the sample at the time of analysis only.

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If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 20/06171
Issue Number: 1
Date: 11 August, 2020

Client: RSK Environment Ltd Castleford
The Potteries
Pottery Street
Castleford
WF10 1NJ

Project Manager: John Harrison
Project Name: Birdwell, Barnsley
Project Ref: 350283
Order No: N/A
Date Samples Received: 17/07/20
Date Instructions Received: 28/07/20
Date Analysis Completed: 11/08/20

Prepared by:



Sophie France
Client Service Manager

Approved by:



Richard Wong
Client Manager

Envirolab Job Number: 20/06171

Client Project Name: Birdwell, Barnsley

Client Project Ref: 350283

Lab Sample ID	20/06171/1	20/06171/2	20/06171/3	20/06171/5	20/06171/6	20/06171/7	20/06171/9	Units	Limit of Detection	Method ref
Client Sample No	1	2	1	1	2	1	1			
Client Sample ID	WS101	WS101	WS102	WS103	WS103	WS104	WS105			
Depth to Top	0.00	0.60	0.00	0.00	0.60	0.00	0.00			
Depth To Bottom	0.20	0.70	0.20	0.20	0.70	0.20	0.20			
Date Sampled	16-Jul-20	16-Jul-20	16-Jul-20	16-Jul-20	16-Jul-20	16-Jul-20	16-Jul-20			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	6AE	5AE	6AE	6AE	5A	6AE	6AE			
% Stones >10mm _A	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	9.6			
pH _D ^{M#}	6.00	-	5.97	6.24	-	7.08	5.68	pH	0.01	A-T-031s
pH BRE _D ^{M#}	-	7.06	-	-	6.27	-	-	pH	0.01	A-T-031s
Sulphate BRE (water sol 2:1) _D ^{M#}	-	13	-	-	25	-	-	mg/l	10	A-T-026s
Sulphate BRE (acid sol) _D ^{M#}	-	0.03	-	-	<0.02	-	-	% w/w	0.02	A-T-028s
Sulphur BRE (total) _D	-	0.02	-	-	<0.01	-	-	% w/w	0.01	A-T-024s
Organic matter _D ^{M#}	10.3	-	14.2	13.9	-	9.5	9.1	% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	9	-	13	8	-	8	7	mg/kg	1	A-T-024s
Cadmium _D ^{M#}	0.6	-	0.7	0.6	-	0.6	0.6	mg/kg	0.5	A-T-024s
Copper _D ^{M#}	27	-	33	34	-	30	33	mg/kg	1	A-T-024s
Chromium _D ^{M#}	28	-	28	23	-	22	21	mg/kg	1	A-T-024s
Lead _D ^{M#}	93	-	105	63	-	58	52	mg/kg	1	A-T-024s
Mercury _D	<0.17	-	<0.17	<0.17	-	<0.17	<0.17	mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	16	-	18	15	-	17	18	mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	-	1	2	-	1	<1	mg/kg	1	A-T-024s
Zinc _D ^{M#}	89	-	112	116	-	79	113	mg/kg	5	A-T-024s

Envirolab Job Number: 20/06171

Client Project Name: Birdwell, Barnsley

Client Project Ref: 350283

Lab Sample ID	20/06171/1	20/06171/2	20/06171/3	20/06171/5	20/06171/6	20/06171/7	20/06171/9	Units	Limit of Detection	Method ref
Client Sample No	1	2	1	1	2	1	1			
Client Sample ID	WS101	WS101	WS102	WS103	WS103	WS104	WS105			
Depth to Top	0.00	0.60	0.00	0.00	0.60	0.00	0.00			
Depth To Bottom	0.20	0.70	0.20	0.20	0.70	0.20	0.20			
Date Sampled	16-Jul-20	16-Jul-20	16-Jul-20	16-Jul-20	16-Jul-20	16-Jul-20	16-Jul-20			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	6AE	5AE	6AE	6AE	5A	6AE	6AE			
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	-	-	-	-	NAD	NAD	A-T-045		
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	-	-	-	-	N/A	N/A	A-T-045		

Envirolab Job Number: 20/06171

Client Project Name: Birdwell, Barnsley

Client Project Ref: 350283

Lab Sample ID	20/06171/1	20/06171/2	20/06171/3	20/06171/5	20/06171/6	20/06171/7	20/06171/9	Units	Limit of Detection	Method ref
Client Sample No	1	2	1	1	2	1	1			
Client Sample ID	WS101	WS101	WS102	WS103	WS103	WS104	WS105			
Depth to Top	0.00	0.60	0.00	0.00	0.60	0.00	0.00			
Depth To Bottom	0.20	0.70	0.20	0.20	0.70	0.20	0.20			
Date Sampled	16-Jul-20	16-Jul-20	16-Jul-20	16-Jul-20	16-Jul-20	16-Jul-20	16-Jul-20			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	6AE	5AE	6AE	6AE	5A	6AE	6AE			
PAH-16MS										
Acenaphthene _A ^{M#}	<0.01	-	0.03	<0.01	-	0.01	<0.01	mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	<0.02	-	0.05	<0.02	-	0.03	<0.02	mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	<0.04	-	0.36	0.10	-	0.22	0.10	mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	<0.04	-	0.38	0.10	-	0.26	0.09	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	<0.05	-	0.43	0.12	-	0.27	0.11	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05	-	0.13	<0.05	-	0.10	<0.05	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	-	0.17	<0.07	-	0.11	<0.07	mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	<0.06	-	0.45	0.13	-	0.29	0.13	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	-	<0.04	<0.04	-	<0.04	<0.04	mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	<0.08	-	0.65	0.19	-	0.40	0.18	mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	<0.01	-	0.02	<0.01	-	<0.01	<0.01	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	<0.03	-	0.18	0.04	-	0.13	0.04	mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	-	<0.03	<0.03	-	<0.03	<0.03	mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	0.05	-	0.30	0.12	-	0.22	0.10	mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	<0.07	-	0.56	0.16	-	0.34	0.15	mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	<0.08	-	3.71	0.96	-	2.38	0.90	mg/kg	0.01	A-T-019s

Envirolab Job Number: 20/06171

Client Project Name: Birdwell, Barnsley

Client Project Ref: 350283

Lab Sample ID	20/06171/10	20/06171/13	20/06171/14	20/06171/16	20/06171/18	20/06171/19	20/06171/21	Units	Limit of Detection	Method ref
Client Sample No	2	1	1	1	1	1	1			
Client Sample ID	WS105	HP01	HP02	HP04	HP06	HP07	HP09			
Depth to Top	0.70	0.10	0.05	0.05	0.15	0.05	0.05			
Depth To Bottom	0.80									
Date Sampled	16-Jul-20	16-Jul-20	16-Jul-20	16-Jul-20	16-Jul-20	17-Jul-20	17-Jul-20			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	5AE	6AE	6AE	6AE	6AE	6AE	6AE			
% Stones >10mm _A	23.8	<0.1	<0.1	<0.1	6.5	<0.1	<0.1			
pH _D ^{M#}	-	7.50	6.35	5.06	6.67	7.65	6.57	pH	0.01	A-T-031s
pH BRE _D ^{M#}	5.97	-	-	-	-	-	-	pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	-	-	<0.01	-	<0.01	-	-	g/l	0.01	A-T-026s
Sulphate BRE (water sol 2:1) _D ^{M#}	11	-	-	-	-	-	-	mg/l	10	A-T-026s
Sulphate (acid soluble) _D ^{M#}	-	-	670	-	1500	-	-	mg/kg	200	A-T-028s
Sulphate BRE (acid sol) _D ^{M#}	<0.02	-	-	-	-	-	-	% w/w	0.02	A-T-028s
Sulphur BRE (total) _D	<0.01	-	-	-	-	-	-	% w/w	0.01	A-T-024s
Arsenic _D ^{M#}	-	19	21	11	13	16	8	mg/kg	1	A-T-024s
Cadmium _D ^{M#}	-	1.1	1.1	0.8	1.0	1.0	1.1	mg/kg	0.5	A-T-024s
Copper _D ^{M#}	-	66	52	98	64	66	69	mg/kg	1	A-T-024s
Chromium _D ^{M#}	-	33	30	27	29	39	36	mg/kg	1	A-T-024s
Lead _D ^{M#}	-	148	92	78	133	163	185	mg/kg	1	A-T-024s
Mercury _D	-	0.24	0.58	<0.17	0.68	0.26	0.34	mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	-	19	19	21	22	21	19	mg/kg	1	A-T-024s
Selenium _D ^{M#}	-	2	2	2	3	2	2	mg/kg	1	A-T-024s
Zinc _D ^{M#}	-	215	287	161	329	305	403	mg/kg	5	A-T-024s

Envirolab Job Number: 20/06171

Client Project Name: Birdwell, Barnsley

Client Project Ref: 350283

Lab Sample ID	20/06171/10	20/06171/13	20/06171/14	20/06171/16	20/06171/18	20/06171/19	20/06171/21	Units	Limit of Detection	Method ref
Client Sample No	2	1	1	1	1	1	1			
Client Sample ID	WS105	HP01	HP02	HP04	HP06	HP07	HP09			
Depth to Top	0.70	0.10	0.05	0.05	0.15	0.05	0.05			
Depth To Bottom	0.80									
Date Sampled	16-Jul-20	16-Jul-20	16-Jul-20	16-Jul-20	16-Jul-20	17-Jul-20	17-Jul-20			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	5AE	6AE	6AE	6AE	6AE	6AE	6AE			
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	-	NAD	-	NAD	-	NAD	NAD		A-T-045	
Asbestos ACM - Suitable for Water Absorption Test? _D	-	N/A	-	N/A	-	N/A	N/A		A-T-045	

Envirolab Job Number: 20/06171

Client Project Name: Birdwell, Barnsley

Client Project Ref: 350283

Lab Sample ID	20/06171/10	20/06171/13	20/06171/14	20/06171/16	20/06171/18	20/06171/19	20/06171/21	Units	Limit of Detection	Method ref
Client Sample No	2	1	1	1	1	1	1			
Client Sample ID	WS105	HP01	HP02	HP04	HP06	HP07	HP09			
Depth to Top	0.70	0.10	0.05	0.05	0.15	0.05	0.05			
Depth To Bottom	0.80									
Date Sampled	16-Jul-20	16-Jul-20	16-Jul-20	16-Jul-20	16-Jul-20	17-Jul-20	17-Jul-20			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	5AE	6AE	6AE	6AE	6AE	6AE	6AE			
PAH-16MS										
Acenaphthene _A ^{M#}	-	-	0.03	-	0.15	-	-	mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	-	-	0.03	-	0.11	-	-	mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	-	-	0.09	-	0.50	-	-	mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	-	-	0.57	-	2.15	-	-	mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	-	-	0.49	-	1.98	-	-	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	-	-	0.54	-	2.20	-	-	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	-	-	0.16	-	0.68	-	-	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	-	-	0.22	-	0.85	-	-	mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	-	-	0.65	-	2.42	-	-	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	-	-	<0.04	-	0.18	-	-	mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	-	-	1.12	-	4.45	-	-	mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	-	-	0.03	-	0.16	-	-	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	-	-	0.22	-	0.90	-	-	mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	-	-	0.04	-	0.13	-	-	mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	-	-	0.53	-	2.60	-	-	mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	-	-	0.94	-	3.58	-	-	mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	-	-	5.66	-	23	-	-	mg/kg	0.01	A-T-019s

Envirolab Job Number: 20/06171

Client Project Name: Birdwell, Barnsley

Client Project Ref: 350283

Lab Sample ID	20/06171/10	20/06171/13	20/06171/14	20/06171/16	20/06171/18	20/06171/19	20/06171/21	Units	Limit of Detection	Method ref
Client Sample No	2	1	1	1	1	1	1			
Client Sample ID	WS105	HP01	HP02	HP04	HP06	HP07	HP09			
Depth to Top	0.70	0.10	0.05	0.05	0.15	0.05	0.05			
Depth To Bottom	0.80									
Date Sampled	16-Jul-20	16-Jul-20	16-Jul-20	16-Jul-20	16-Jul-20	17-Jul-20	17-Jul-20			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	5AE	6AE	6AE	6AE	6AE	6AE	6AE			
TPH CWG										
Ali >C5-C6 _A [#]	-	-	<0.01	-	<0.01	-	-	mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	-	-	<0.01	-	<0.01	-	-	mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	-	-	<1	-	3	-	-	mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	-	-	<1	-	1	-	-	mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	-	-	<1	-	3	-	-	mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	-	-	<1	-	4	-	-	mg/kg	1	A-T-055s
Ali >C21-C35 _A	-	-	4	-	21	-	-	mg/kg	1	A-T-055s
Total Aliphatics _A	-	-	4	-	32	-	-	mg/kg	1	A-T-055s
Aro >C5-C7 _A [#]	-	-	<0.01	-	<0.01	-	-	mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	-	-	<0.01	-	<0.01	-	-	mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	-	-	1	-	4	-	-	mg/kg	1	A-T-055s
Aro >C10-C12 _A ^{M#}	-	-	<1	-	4	-	-	mg/kg	1	A-T-055s
Aro >C12-C16 _A	-	-	3	-	14	-	-	mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	-	-	10	-	45	-	-	mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	-	-	34	-	107	-	-	mg/kg	1	A-T-055s
Total Aromatics _A	-	-	48	-	174	-	-	mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35) _A	-	-	52	-	206	-	-	mg/kg	1	A-T-055s
BTEX - Benzene _A [#]	-	-	<0.01	-	<0.01	-	-	mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	-	-	<0.01	-	<0.01	-	-	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	-	-	<0.01	-	<0.01	-	-	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	-	-	<0.01	-	<0.01	-	-	mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	-	-	<0.01	-	<0.01	-	-	mg/kg	0.01	A-T-022s
MTBE _A [#]	-	-	<0.01	-	<0.01	-	-	mg/kg	0.01	A-T-022s

Envirolab Job Number: 20/06171

Client Project Name: Birdwell, Barnsley

Client Project Ref: 350283

Lab Sample ID	20/06171/22	20/06171/23	20/06171/24	20/06171/26	20/06171/28	20/06171/29	20/06171/31	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP201	TP202	WS107	WS108	WS108	WS109	WS110			
Depth to Top	0.20	0.10	0.00	0.00	0.80	0.00	0.00			
Depth To Bottom			0.10	0.20	0.90	0.20	0.10			
Date Sampled	16-Jul-20	16-Jul-20	17-Jul-20	17-Jul-20	17-Jul-20	17-Jul-20	17-Jul-20			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Sample Matrix Code	6AE	6AE	6AE	6AE	5A	6AE	6AE			
% Stones >10mm _A	17.5	14.9	2.3	<0.1	<0.1	<0.1	5.4			
pH _D ^{M#}	5.99	5.97	6.31	8.52	-	6.24	7.32	pH	0.01	A-T-031s
pH BRE _D ^{M#}	-	-	-	-	7.32	-	-	pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	-	<0.01	-	-	-	-	-	g/l	0.01	A-T-026s
Sulphate BRE (water sol 2:1) _D ^{M#}	-	-	-	-	144	-	-	mg/l	10	A-T-026s
Sulphate (acid soluble) _D ^{M#}	-	440	-	-	-	-	-	mg/kg	200	A-T-028s
Sulphate BRE (acid sol) _D ^{M#}	-	-	-	-	0.03	-	-	% w/w	0.02	A-T-028s
Sulphur BRE (total) _D	-	-	-	-	0.02	-	-	% w/w	0.01	A-T-024s
Organic matter _D ^{M#}	3.5	-	17.7	-	-	12.1	-	% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	7	7	21	16	-	14	28	mg/kg	1	A-T-024s
Cadmium _D ^{M#}	0.6	0.7	1.3	1.1	-	1.8	1.3	mg/kg	0.5	A-T-024s
Copper _D ^{M#}	24	29	83	155	-	47	81	mg/kg	1	A-T-024s
Chromium _D ^{M#}	17	19	28	887	-	32	38	mg/kg	1	A-T-024s
Lead _D ^{M#}	40	50	205	136	-	154	354	mg/kg	1	A-T-024s
Mercury _D	<0.17	<0.17	<0.17	0.20	-	<0.17	<0.17	mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	15	17	24	39	-	20	29	mg/kg	1	A-T-024s
Selenium _D ^{M#}	2	2	2	5	-	3	4	mg/kg	1	A-T-024s
Zinc _D ^{M#}	69	73	246	145	-	340	499	mg/kg	5	A-T-024s

Envirolab Job Number: 20/06171

Client Project Name: Birdwell, Barnsley

Client Project Ref: 350283

Lab Sample ID	20/06171/22	20/06171/23	20/06171/24	20/06171/26	20/06171/28	20/06171/29	20/06171/31	Units	Limit of Detection	Method ref			
Client Sample No													
Client Sample ID	TP201	TP202	WS107	WS108	WS108	WS109	WS110						
Depth to Top	0.20	0.10	0.00	0.00	0.80	0.00	0.00						
Depth To Bottom			0.10	0.20	0.90	0.20	0.10						
Date Sampled	16-Jul-20	16-Jul-20	17-Jul-20	17-Jul-20	17-Jul-20	17-Jul-20	17-Jul-20						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Sample Matrix Code	6AE	6AE	6AE	6AE	5A	6AE	6AE						
Asbestos in Soil (inc. matrix)													
Asbestos in soil [#]	-	-	NAD	NAD	-	NAD	NAD			A-T-045			
Asbestos ACM - Suitable for Water Absorption Test? _D	-	-	N/A	N/A	-	N/A	N/A			A-T-045			

Envirolab Job Number: 20/06171

Client Project Name: Birdwell, Barnsley

Client Project Ref: 350283

Lab Sample ID	20/06171/22	20/06171/23	20/06171/24	20/06171/26	20/06171/28	20/06171/29	20/06171/31	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP201	TP202	WS107	WS108	WS108	WS109	WS110			
Depth to Top	0.20	0.10	0.00	0.00	0.80	0.00	0.00			
Depth To Bottom			0.10	0.20	0.90	0.20	0.10			
Date Sampled	16-Jul-20	16-Jul-20	17-Jul-20	17-Jul-20	17-Jul-20	17-Jul-20	17-Jul-20			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Sample Matrix Code	6AE	6AE	6AE	6AE	5A	6AE	6AE			
PAH-16MS										
Acenaphthene _A ^{M#}	<0.01	<0.01	0.17	-	-	0.01	-	mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	<0.01	0.18	-	-	0.04	-	mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	<0.02	<0.02	0.84	-	-	0.06	-	mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.13	0.09	3.10	-	-	0.52	-	mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.13	0.11	2.72	-	-	0.51	-	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	0.14	0.12	2.76	-	-	0.55	-	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.07	<0.05	0.98	-	-	0.18	-	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	<0.07	1.17	-	-	0.22	-	mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	0.16	0.13	3.12	-	-	0.68	-	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	<0.04	0.26	-	-	<0.04	-	mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	0.23	0.15	6.87	-	-	0.83	-	mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	<0.01	<0.01	0.28	-	-	0.01	-	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.09	0.06	1.34	-	-	0.22	-	mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	0.11	-	-	<0.03	-	mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	0.11	0.08	4.06	-	-	0.33	-	mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	0.20	0.13	5.50	-	-	0.79	-	mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	1.26	0.87	33.5	-	-	4.95	-	mg/kg	0.01	A-T-019s

Envirolab Job Number: 20/06171

Client Project Name: Birdwell, Barnsley

Client Project Ref: 350283

Lab Sample ID	20/06171/22	20/06171/23	20/06171/24	20/06171/26	20/06171/28	20/06171/29	20/06171/31	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP201	TP202	WS107	WS108	WS108	WS109	WS110			
Depth to Top	0.20	0.10	0.00	0.00	0.80	0.00	0.00			
Depth To Bottom			0.10	0.20	0.90	0.20	0.10			
Date Sampled	16-Jul-20	16-Jul-20	17-Jul-20	17-Jul-20	17-Jul-20	17-Jul-20	17-Jul-20			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Sample Matrix Code	6AE	6AE	6AE	6AE	5A	6AE	6AE			
TPH CWG										
Ali >C5-C6 _A [#]	-	<0.01	-	-	-	-	-	mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	-	<0.01	-	-	-	-	-	mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	-	<1	-	-	-	-	-	mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	-	<1	-	-	-	-	-	mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	-	<1	-	-	-	-	-	mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	-	<1	-	-	-	-	-	mg/kg	1	A-T-055s
Ali >C21-C35 _A	-	5	-	-	-	-	-	mg/kg	1	A-T-055s
Total Aliphatics _A	-	5	-	-	-	-	-	mg/kg	1	A-T-055s
Aro >C5-C7 _A [#]	-	<0.01	-	-	-	-	-	mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	-	<0.01	-	-	-	-	-	mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	-	<1	-	-	-	-	-	mg/kg	1	A-T-055s
Aro >C10-C12 _A ^{M#}	-	<1	-	-	-	-	-	mg/kg	1	A-T-055s
Aro >C12-C16 _A	-	2	-	-	-	-	-	mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	-	4	-	-	-	-	-	mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	-	14	-	-	-	-	-	mg/kg	1	A-T-055s
Total Aromatics _A	-	20	-	-	-	-	-	mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35) _A	-	25	-	-	-	-	-	mg/kg	1	A-T-055s
BTEX - Benzene _A [#]	-	<0.01	-	-	-	-	-	mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	-	<0.01	-	-	-	-	-	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	-	<0.01	-	-	-	-	-	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	-	<0.01	-	-	-	-	-	mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	-	<0.01	-	-	-	-	-	mg/kg	0.01	A-T-022s
MTBE _A [#]	-	<0.01	-	-	-	-	-	mg/kg	0.01	A-T-022s

Envirolab Job Number: 20/06171

Client Project Name: Birdwell, Barnsley

Client Project Ref: 350283

Lab Sample ID	20/06171/32	20/06171/33	20/06171/34	20/06171/35	20/06171/36			Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS110	WS111	WS111	WS112	WS112					
Depth to Top	0.60	0.00	0.40	0.00	0.60					
Depth To Bottom	0.70	0.20	0.50	0.10	0.70					
Date Sampled	17-Jul-20	17-Jul-20	17-Jul-20	17-Jul-20	17-Jul-20					
Sample Type	Soil	Soil	Soil	Soil	Soil					
Sample Matrix Code	5A	6AE	5AE	6AE	5A					
% Stones >10mm _A	<0.1	9.0	<0.1	10.3	<0.1					
pH _D ^{M#}	-	5.87	6.88	6.36	7.36			pH	0.01	A-T-031s
pH BRE _D ^{M#}	5.98	-	-	-	7.36			pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	-	0.03	-	0.09	-			g/l	0.01	A-T-026s
Sulphate BRE (water sol 2:1) _D ^{M#}	54	-	-	-	16			mg/l	10	A-T-026s
Sulphate (acid soluble) _D ^{M#}	-	250	-	210	-			mg/kg	200	A-T-028s
Sulphate BRE (acid sol) _D ^{M#}	0.02	-	-	-	<0.02			% w/w	0.02	A-T-028s
Sulphur BRE (total) _D	0.02	-	-	-	<0.01			% w/w	0.01	A-T-024s
Arsenic _D ^{M#}	-	10	50	10	1			mg/kg	1	A-T-024s
Cadmium _D ^{M#}	-	1.2	0.6	0.8	0.7			mg/kg	0.5	A-T-024s
Copper _D ^{M#}	-	51	63	39	17			mg/kg	1	A-T-024s
Chromium _D ^{M#}	-	31	36	25	23			mg/kg	1	A-T-024s
Lead _D ^{M#}	-	119	37	85	22			mg/kg	1	A-T-024s
Mercury _D	-	<0.17	0.31	<0.17	<0.17			mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	-	21	13	19	21			mg/kg	1	A-T-024s
Selenium _D ^{M#}	-	2	1	2	2			mg/kg	1	A-T-024s
Zinc _D ^{M#}	-	597	39	211	97			mg/kg	5	A-T-024s

Envirolab Job Number: 20/06171

Client Project Name: Birdwell, Barnsley

Client Project Ref: 350283

Lab Sample ID	20/06171/32	20/06171/33	20/06171/34	20/06171/35	20/06171/36			Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS110	WS111	WS111	WS112	WS112					
Depth to Top	0.60	0.00	0.40	0.00	0.60					
Depth To Bottom	0.70	0.20	0.50	0.10	0.70					
Date Sampled	17-Jul-20	17-Jul-20	17-Jul-20	17-Jul-20	17-Jul-20					
Sample Type	Soil	Soil	Soil	Soil	Soil					
Sample Matrix Code	5A	6AE	5AE	6AE	5A					
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	-	-	-	NAD	-					A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	-	-	-	N/A	-					A-T-045

Envirolab Job Number: 20/06171

Client Project Name: Birdwell, Barnsley

Client Project Ref: 350283

Lab Sample ID	20/06171/32	20/06171/33	20/06171/34	20/06171/35	20/06171/36			Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS110	WS111	WS111	WS112	WS112					
Depth to Top	0.60	0.00	0.40	0.00	0.60					
Depth To Bottom	0.70	0.20	0.50	0.10	0.70					
Date Sampled	17-Jul-20	17-Jul-20	17-Jul-20	17-Jul-20	17-Jul-20					
Sample Type	Soil	Soil	Soil	Soil	Soil					
Sample Matrix Code	5A	6AE	5AE	6AE	5A					
PAH-16MS										
Acenaphthene _A ^{M#}	-	<0.01	-	0.03	-			mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	-	<0.01	-	0.03	-			mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	-	<0.02	-	0.11	-			mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	-	0.12	-	0.70	-			mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	-	0.12	-	0.63	-			mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	-	0.13	-	0.71	-			mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	-	<0.05	-	0.19	-			mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	-	<0.07	-	0.29	-			mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	-	0.14	-	0.79	-			mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	-	<0.04	-	0.05	-			mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	-	0.23	-	1.43	-			mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	-	<0.01	-	0.03	-			mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	-	0.06	-	0.26	-			mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	-	<0.03	-	0.04	-			mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	-	0.11	-	0.63	-			mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	-	0.19	-	1.18	-			mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	-	1.10	-	7.10	-			mg/kg	0.01	A-T-019s

Envirolab Job Number: 20/06171

Client Project Name: Birdwell, Barnsley

Client Project Ref: 350283

Lab Sample ID	20/06171/32	20/06171/33	20/06171/34	20/06171/35	20/06171/36			Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS110	WS111	WS111	WS112	WS112					
Depth to Top	0.60	0.00	0.40	0.00	0.60					
Depth To Bottom	0.70	0.20	0.50	0.10	0.70					
Date Sampled	17-Jul-20	17-Jul-20	17-Jul-20	17-Jul-20	17-Jul-20					
Sample Type	Soil	Soil	Soil	Soil	Soil					
Sample Matrix Code	5A	6AE	5AE	6AE	5A					
TPH CWG										
Ali >C5-C6 _A [#]	-	<0.01	-	<0.01	-			mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	-	<0.01	-	<0.01	-			mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	-	<1	-	<1	-			mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	-	<1	-	<1	-			mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	-	<1	-	<1	-			mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	-	<1	-	<1	-			mg/kg	1	A-T-055s
Ali >C21-C35 _A	-	2	-	3	-			mg/kg	1	A-T-055s
Total Aliphatics _A	-	2	-	3	-			mg/kg	1	A-T-055s
Aro >C5-C7 _A [#]	-	<0.01	-	<0.01	-			mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	-	<0.01	-	<0.01	-			mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	-	<1	-	<1	-			mg/kg	1	A-T-055s
Aro >C10-C12 _A ^{M#}	-	<1	-	<1	-			mg/kg	1	A-T-055s
Aro >C12-C16 _A	-	<1	-	2	-			mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	-	<1	-	9	-			mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	-	5	-	23	-			mg/kg	1	A-T-055s
Total Aromatics _A	-	5	-	34	-			mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35) _A	-	7	-	37	-			mg/kg	1	A-T-055s
BTEX - Benzene _A [#]	-	<0.01	-	<0.01	-			mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	-	<0.01	-	<0.01	-			mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	-	<0.01	-	<0.01	-			mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	-	<0.01	-	<0.01	-			mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	-	<0.01	-	<0.01	-			mg/kg	0.01	A-T-022s
MTBE _A [#]	-	<0.01	-	<0.01	-			mg/kg	0.01	A-T-022s

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.



APPENDIX K LABORATORY CERTIFICATES FOR GEOTECHNICAL ANALYSIS



STRUCTURAL SOILS LTD
TEST REPORT



Report No. 784339 r1

1774

Date 17-February-2020 Contract Birdwell, Barnsley 350283

Client RSK Environment Ltd
Address Spring Lodge
172 Chester Road
Helsby
Cheshire WA6 0AR

For the Attention of Laura Alderman

Samples submitted by client	31/01/2020	Client Reference	350283
Testing Started	03/02/2020	Client Order No.	
Testing Completed	17/02/2020	Instruction Type	Written

Tests marked 'Not UKAS Accredited' in this report are not included in the UKAS Accreditation Schedule for our Laboratory.

Ukas Accredited Tests Underatken

Moisture Content (oven drying method) BS1377:Part 2:1990,clause 3.2 (superseded)**
Liquid Limit (definitive method) BS1377:Part 2:1990,clause 4.3
Plastic Limit BS1377:Part 2:1990,clause 5.3
Plasticity Index Derivation BS1377:Part 2:1990,clause 5.4

* This clause of BS1377 is no longer the most up to date method due to the publication of ISO17892

Please Note: Remaining samples will be retained for a period of one month from today and will then be disposed of.
Test were undertaken on samples 'as received' unless otherwise stated.
Opinions and interpretations expressed in this report are outside the scope of accreditation for this laboratory.

Structural Soils Ltd, The Potteries, Pottery Street, Castleford, WF10 1NJ Tel.01977 552255. E-mail mark.athorne@soils.co.uk

SUMMARY OF SOIL CLASSIFICATION TESTS

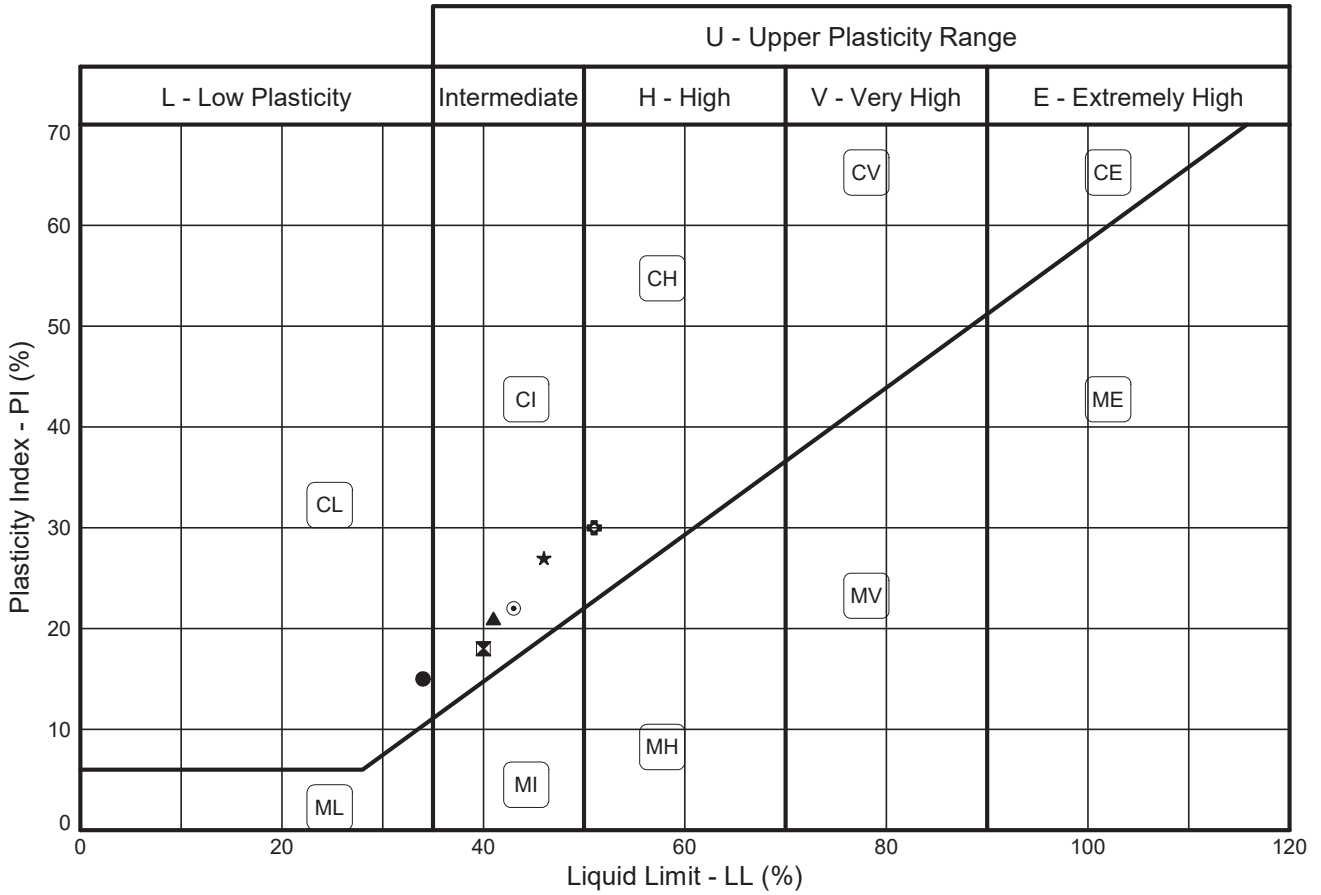
In accordance with clauses 3.2,4.3,4.4,5.3,5.4,7.2,8.2,8.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425um	Description of Sample
TP01		D	0.75	17	34	19	15	70	Light brown silty slightly gravelly CLAY
TP02		D	0.40	25	40	22	18	86	Light brown slightly sandy slightly gravelly CLAY
TP02		D	0.80	23	41	20	21	97	Light brown grey slightly silty slightly gravelly CLAY
TP04		D	2.50	15	46	19	27	86	Dark brown green slightly sandy CLAY with mudstone
TP06		D	1.20	20	43	21	22	94	Dark brown slightly sandy slightly gravelly CLAY
TP07		D	1.50	20	51	21	30	99	Grey slightly sandy slightly gravelly CLAY

 <p>STRUCTURAL SOILS LTD</p>	<p>Contract Ref:</p> <p>784339</p>
<p>Contract:</p> <p>Birdwell, Barnsley 350283</p>	

PLASTICITY CHART - PI Vs LL

In accordance with BS5930:2015
Testing in accordance with BS1377-2:1990

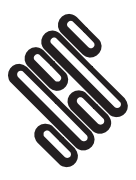


Sample Identification			BS Test Method #	Preparation Method +	MC %	LL %	PL %	PI %	<425um %	Lab location	
Exploratory Position ID	Sample	Depth (m)									
●	TP01	D	0.75	3.2/4.3/5.3/5.4	4.2.4	17	34	19	15	70	C
⊠	TP02	D	0.40	3.2/4.3/5.3/5.4	4.2.4	25	40	22	18	86	C
▲	TP02	D	0.80	3.2/4.3/5.3/5.4	4.2.4	23	41	20	21	97	C
★	TP04	D	2.50	3.2/4.3/5.3/5.4	4.2.4	15	46	19	27	86	C
⊙	TP06	D	1.20	3.2/4.3/5.3/5.4	4.2.4	20	43	21	22	94	C
⊕	TP07	D	1.50	3.2/4.3/5.3/5.4	4.2.4	20	51	21	30	99	C

Tested in accordance with the following clauses of BS1377-2:1990.
3.2 - Moisture Content
4.3 - Cone Penetrometer Method
4.4 - One Point Cone Penetrometer Method
4.6 - One Point Casagrande Method
5.3 - Plastic Limit Method
5.4 - Plasticity Index

+ Tested in accordance with the following clauses of BS1377-2:1990.
4.2.3 - Natural State
4.2.4 - Wet Sieved
Key: * = Non-standard test, NP = Non plastic.

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)



STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1NJ

Compiled By		Date
		17/02/20
Contract		Contract Ref:
Birdwell, Barnsley 350283		784339



GINT_LIBRARY_v8_07_GLB LibVersion: v8_07_001 PjVersion: v8_07 | Graph L - ALINE STANDARD - A4P | 784339 - BIRDWELL, BARNESLEY 350283.GPJ - v8_07. Structural Soils Ltd, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk, | 17/02/20 - 15:37 | LWS |

TESTING VERIFICATION CERTIFICATE



1774

The test results included in this report are certified as:-

ISSUE STATUS: **FINAL**

In accordance with the Structural Soils Ltd Laboratory Quality Management System, results sheets and summaries of results issued by the laboratory are checked by an approved signatory. The integrity of the test data and results are ensured by control of the computer system employed by the laboratory as part of the Software Verification Program as detailed in the Laboratory Quality Manual.

This testing verification certificate covers all testing compiled on or before the following datetime: **17/02/2020 15:45:11**.

Testing reported after this date is not covered by this Verification Certificate.

Approved Signatory
Luke Fisher (Materials Laboratory Manager)

(Head Office)
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Castleford Laboratory
The Potteries, Pottery Street
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Hemel Laboratory
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Tonbridge Laboratory
Anerley Court, Half Moon Lane
Hildenborough
Tonbridge
TN11 9HU



**STRUCTURAL
SOILS LTD**

Contract:

Birdwell, Barnsley 350283

Job No:

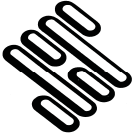
784339





APPENDIX L

SOAKAWAY TEST RESULTS



STRUCTURAL SOILS LTD
INSITU TESTING REPORT



1774

Report No. 784304.R01(00)

Date 04-February-2020 Contract Hay Green Lane, Barnsley
Client RSK Environment
Address Accounts Payable
Spring Lodge
172 Chester Road
Helsby
Cheshire
WA6 0AR For the Attention of Laura Alderman

Order received	03-January-2020	Client Reference	None
Testing Started	29-January-2020	Client Order No.	P02101366
Testing Completed	30-January-2020	Instruction Type	Written

Tests marked 'Not UKAS Accredited' in this report are not included in the UKAS Accreditation Schedule for our Laboratory.

UKAS Accredited Tests

Not - UKAS Tests:

* Soakaway Testing to BRE Digest 365
Please note that 3 fills in each pit was not achievable due to time constraints/ground conditions

The results represent the ground conditions at the specified locations and depths at the time of testing.

Please Note: Remaining samples will be retained for a period of one month from today and will then be disposed of.
Test were undertaken on samples 'as received' unless otherwise stated.
Opinions and interpretations expressed in this report are outside the scope of accreditation for this laboratory.

Structural Soils Ltd, The Potteries, Pottery Street, Castleford, WF10 1NJ Tel.01977552255. e-mail matthew.doran@soils.co.uk

TESTING VERIFICATION CERTIFICATE

The test results included in this report are certified as:-

ISSUE STATUS: **FINAL**

In accordance with the Structural Soils Ltd Laboratory Quality Management System, results sheets and summaries of results issued by the laboratory are checked by an approved signatory. The integrity of the test data and results are ensured by control of the computer system employed by the laboratory as part of the Software Verification Program as detailed in the Laboratory Quality Manual.

This testing verification certificate covers all testing compiled on or before the following datetime: **04/02/2020 11:41:49**.

Testing reported after this date is not covered by this Verification Certificate.



Approved Signatory
Matthew Doran (Site Testing Technician)

(Head Office)
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Castleford Laboratory
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Hemel Laboratory
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Hertfordshire
HP3 9RT

Tonbridge Laboratory
Anerley Court, Half Moon Lane
Hildenborough
Tonbridge
TN11 9HU



**STRUCTURAL
SOILS LTD**

Contract:

Hay Green Lane

Job No:

784304



FULL SCALE SOAKAWAY TEST

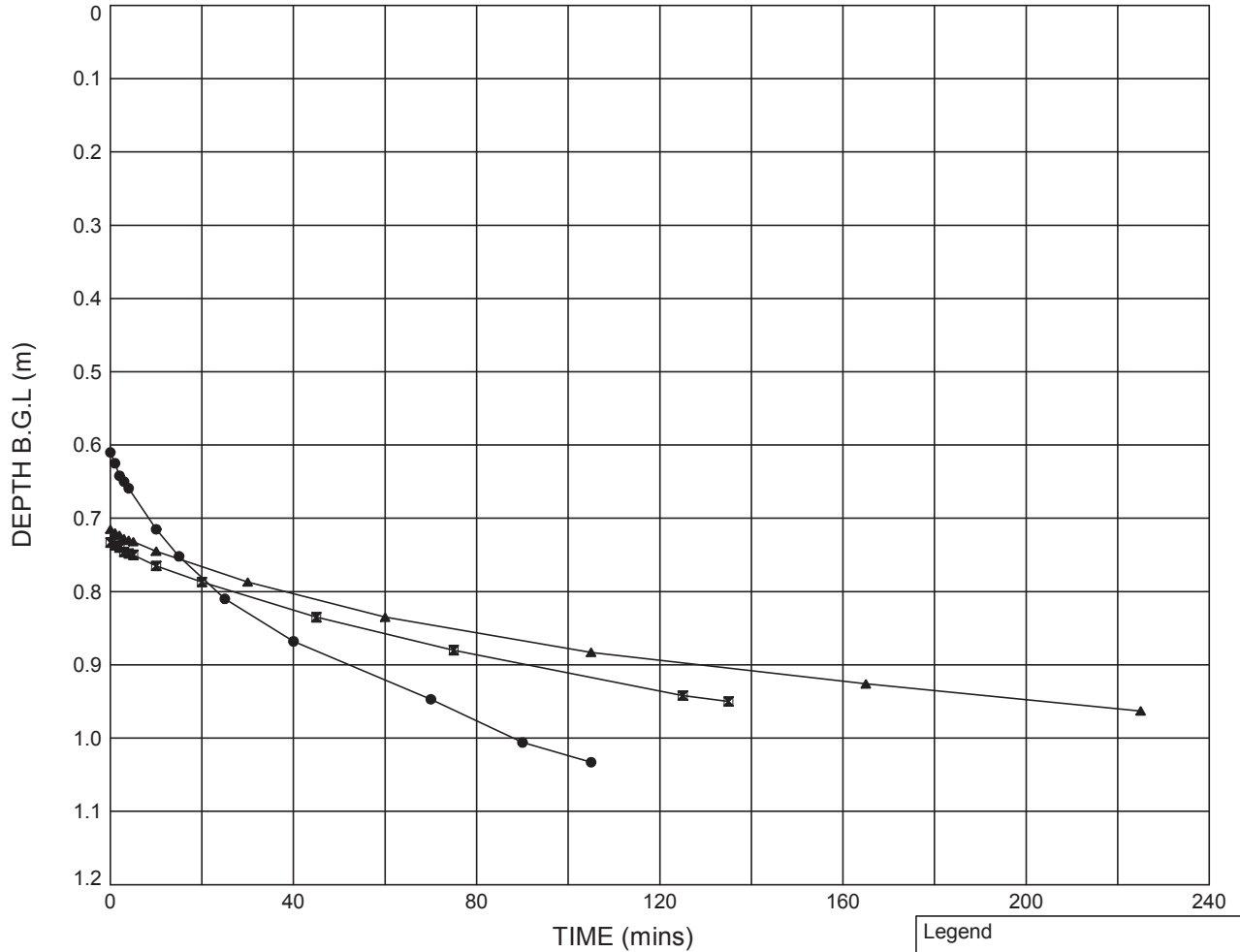
In accordance with BRE Digest 365

Soakaway Test - Position ID : SA1

Ground Level (m): ---

Co-ordinates: ---

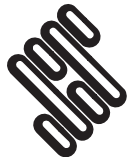
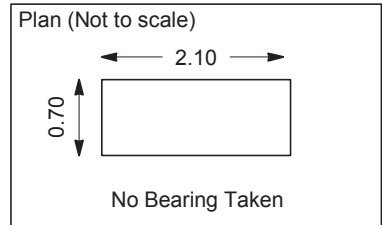
Plot of Depth of Water Below Ground Level Against Time



	Test 1	Test 2	Test 3	
Pit start depth:	1.15	1.15	1.10	m
Pit final depth:	1.15	1.10	1.10	m
Effective depth, D_e	0.54	0.37	0.39	m
Effective storage volume, V_{p75-25}	0.3969	0.2697	0.2830	m^3
Surface area, a_{p50}	2.9820	2.4976	2.5480	m^2
Time, t_{p75-25}	4857	10089	14756	secs
Infiltration rate, f	2.74×10^{-5}	1.07×10^{-5}	7.53×10^{-6}	m/s

Please note test data was extrapolated to obtain $t_{p75-tp25}$.

Legend		
●	Test 1	(29.01.20)
■	Test 2	(29.01.20)
▲	Test 3	(30.01.20)



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Compiled By	Date	Checked By	Date
K. Flincher	04/02/20	<i>[Signature]</i>	04/02/20
Contract		Contract Ref:	
Hay Green Lane		784304	

GINT_LIBRARY_V8_07_GLB.LibVersion: v8_07_001 PjVersion: v8_07 | Graph 1 - TP SOAKAWAY - 2 - FINAL REPORT - A4P | 784304 - HAY GREEN LANE.GPJ - v8_07 | 04/02/20 - 11:02 | KL2 |

FULL SCALE SOAKAWAY TEST

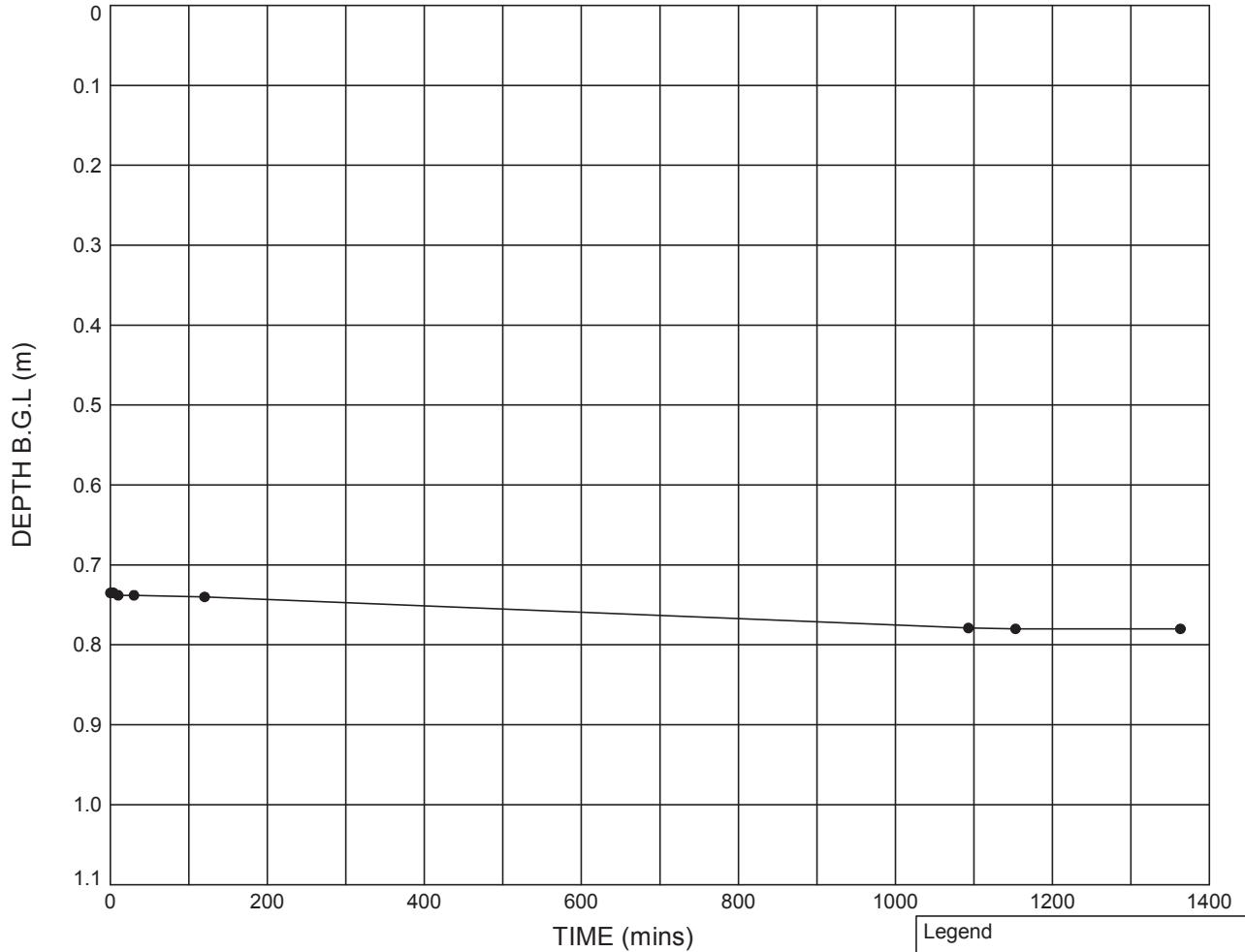
Non-standard test

Soakaway Test - Position ID : SA2

Ground Level (m): ---

Co-ordinates: ---

Plot of Depth of Water Below Ground Level Against Time



Pit start depth: = **1.10** m
 Pit final depth: = **1.10** m
 Effective depth, D_e = **0.37** m
 Effective storage volume, V_{p75-25} = **0.2172** m³
 Surface area, a_{p50} = **2.0660** m²
 Time, t_{p75-25} = **2956500** secs
 Infiltration rate, f = **3.56×10^{-8}** m/s

Please note test data was extrapolated to obtain $t_{p75-tp25}$.

Legend

● Test 1 (29.01.20)

Plan (Not to scale)

No Bearing Taken

GINT_LIBRARY_v8_07_GLB.LibVersion: v8_07_001 ProjVersion: v8_07 | Graph 1 - TP SOAKAWAY - 2 - FINAL REPORT - A4P | 784304 - HAY GREEN LANE.GPJ - v8_07 | 04/02/20 - 11:03 | KL2 |



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Compiled By	Date	Checked By	Date
<i>K. Flunocher</i>	04/02/20	<i>M. D...</i>	04/02/20
Contract		Contract Ref:	
Hay Green Lane		784304	

FULL SCALE SOAKAWAY TEST

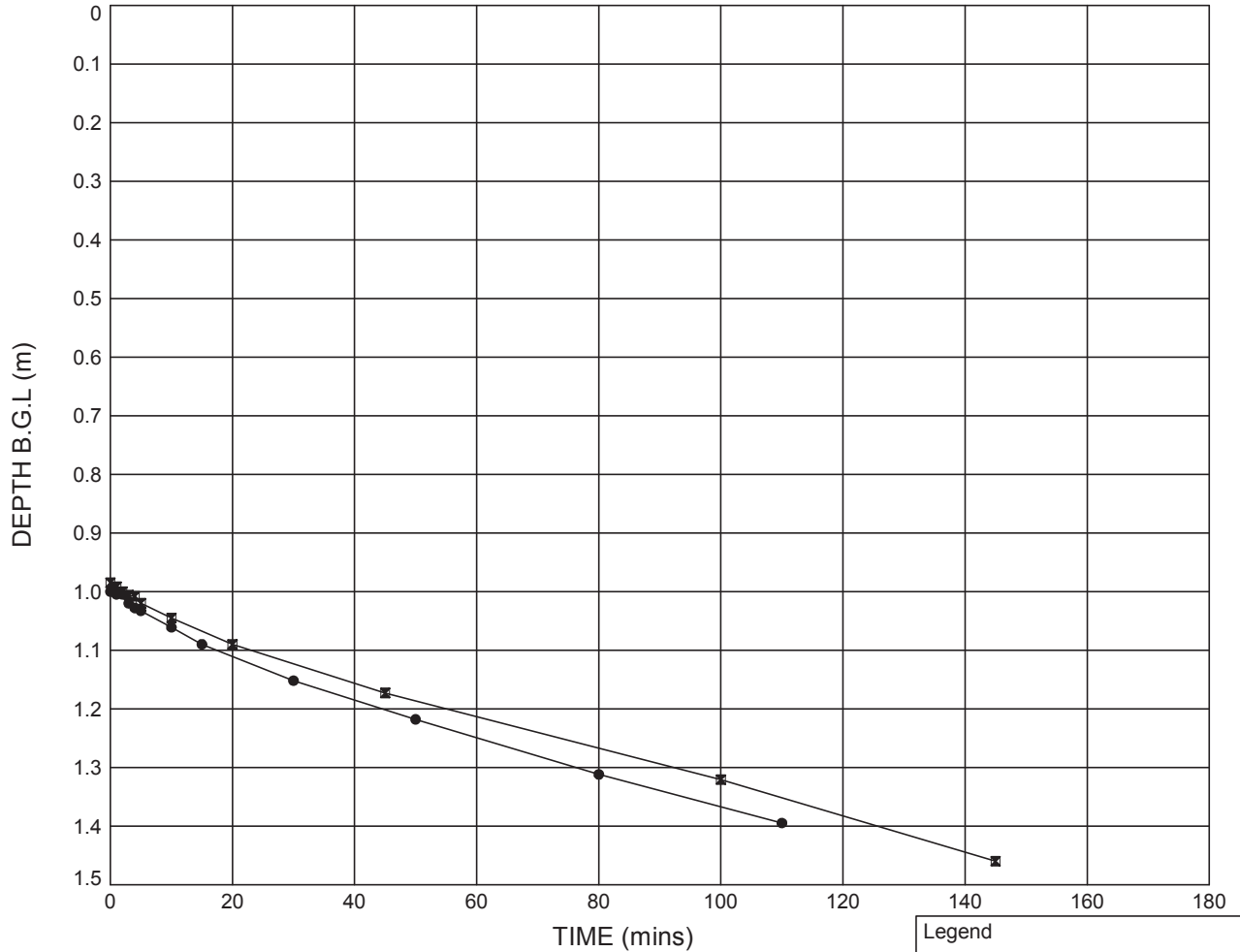
Non-standard test

Soakaway Test - Position ID : SA3

Ground Level (m): ---

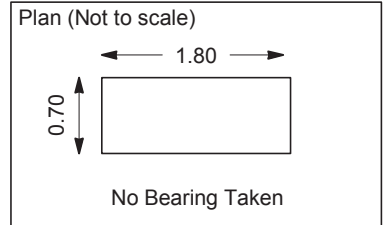
Co-ordinates: ---

Plot of Depth of Water Below Ground Level Against Time



	Test 1	Test 2	
Pit start depth:	= 1.50	1.50	m
Pit final depth:	= 1.50	1.50	m
Effective depth, D_e	= 0.50	0.52	m
Effective storage volume, V_{p75-25}	= 0.3150	0.3245	m^3
Surface area, a_{p50}	= 2.5100	2.5475	m^2
Time, t_{p75-25}	= 4758	5347	secs
Infiltration rate, f	= 2.64×10^{-5}	2.38×10^{-5}	m/s

Legend		
●	Test 1	(30.01.20)
■	Test 2	(30.01.20)



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Compiled By	Date	Checked By	Date
<i>K. Flunocher</i>	04/02/20	<i>M. Daw</i>	04/02/20
Contract		Contract Ref:	
Hay Green Lane		784304	



APPENDIX M GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH

Generic assessment criteria for human health: residential scenario with home-grown produce

Background

RSK's generic assessment criteria (GAC) were initially prepared following the publication by the Environment Agency (EA) of soil guideline value (SGV) and toxicological (TOX) reports, and associated publications in 2009⁽¹⁾. RSK GAC were updated following the publication of GAC by LQM/CIEH in 2009⁽²⁾. RSK GAC are periodically revised when updated information on toxicological, land use or receptor parameters is published.

Updates to the RSK GAC

In 2014, the publication of Category 4 Screening Levels (C4SL)^(3,4), as part of the Defra-funded research project SP1010, included modifications to certain exposure assumptions documented within EA Science Report SC050221/SR3 (herein after referred to as SR3)⁽⁵⁾ used in the generation of SGVs.

C4SL were published for six substances (cadmium, arsenic, benzene, benzo(a)pyrene, chromium VI and lead) for a sandy loam soil type with 6% soil organic matter, based on a low level of toxicological concern (LLTC; see Section 2.3 of research project report SP1010⁽³⁾). Where a C4SL has been published, the RSK GAC duplicates the C4SL published values using all input parameters within the SP1010 final project report⁽³⁾ and associated appendices⁽⁶⁾, and adopts them as GAC for these six substances.

For all other substances the C4SL exposure modifications, with the exception of the "top two" produce type approach taken in the C4SL, have been applied to the current RSK GAC. These include alterations to daily inhalation rates for residential and commercial scenarios, reducing soil adherence factors in children (age classes 1 to 12 only) for residential land use, reducing exposure frequency for dermal contact outdoors for residential land use, and updated produce type consumption rates (90th percentile) based on recent data from the National Diet and Nutrition Survey.

The RSK GAC have also been revised with updated toxicology published by LQM/CIEH in 2015⁽⁷⁾ or by the USEPA⁽¹⁴⁾, where a C4SL has not been published.

RSK GAC derivation for metals and organic compounds

Model selection

Soil assessment criteria (SAC) were calculated using the Contaminated Land Exposure Assessment (CLEA) tool v1.071, supporting EA guidance^(5,8,9) and revised exposure scenarios published for the C4SL⁽³⁾. The SAC are also termed GAC.

Conceptual model

In accordance with SR3⁽⁵⁾, the residential with home-grown produce scenario considers risks to a female child between the ages of 0 and 6 years old as the highest risk scenario. In accordance with Box 3.1 of SR3⁽⁵⁾, the pathways considered for production of the SAC in the residential with home-grown produce scenario are

- direct soil and dust ingestion

- consumption of home-grown produce
- consumption of soil attached to home-grown produce
- dermal contact with soil and indoor dust
- inhalation of indoor and outdoor dust and vapours.

Figure 1 is a conceptual model illustrating these linkages.

In line with guidance in the EA SGV report for cadmium⁽¹⁾, the RSK GAC for cadmium has been derived based on estimates representative of lifetime exposure. Although young children are generally more likely to have higher exposures to soil contaminants, the renal toxicity of cadmium, and the derivation of the TDI_{oral} and TDI_{inh} , are based on considerations of the kidney burden accumulated over 50 years or so. It is therefore reasonable to consider exposure not just in childhood but averaged over a longer period.

With respect to volatilisation, the CLEA model assumes a simple linear partitioning of a chemical in the soil between the sorbed, dissolved and vapour phase⁽⁹⁾. The upper boundaries of this partitioning are represented by the maximum aqueous solubility and pure saturated vapour concentration of the chemical. The CLEA model estimates saturated soil concentrations where these limits are reached⁽⁹⁾. The CLEA software uses a traffic light system to identify when individual and/or combined assessment criteria exceed the lower of either the aqueous- or vapour-based soil saturation limits. Model output cells are flagged red where the saturated soil concentration has been exceeded and the contribution of the indoor and outdoor vapour pathway to total exposure is greater than 10%. In this case, further consideration of the following is required⁽⁹⁾ □

- Free phase contamination may be present.
- Exposure from the vapour pathways will be over-predicted by the model, as in reality the vapour phase concentration will not increase at concentrations above saturation limits
- Where the vapour pathway contribution is greater than 90%, it is unlikely the relevant health criteria value (HCV) will be exceeded at soil concentrations at least a factor of ten higher than the relevant HCV.

Where the vapour pathway is the predominant pathway (contributes greater than 90% of exposure) or the only exposure route considered and the cell is highlighted red (SAC exceeds saturation limit), the risk based on the assumed conceptual model is likely to be negligible as the vapour risk is assumed to be tolerable at maximum possible soil concentrations. In such circumstances, the vapour pathway exposure should be considered based on the presence of free phase or non-aqueous phase liquid sources and the measured concentrations of volatile organic compounds (VOC) in the vapour phase. Screening could be considered based on setting the SAC as the modelled soil saturation limits. However, as stated within the CLEA handbook⁽⁹⁾, this is likely to not be practical in many cases because of the very low saturation limits and, in any case, is highly conservative.

It should also be noted that for mixtures of compounds, free phase may be present where soil (or groundwater) concentrations are well below saturation limits for individual compounds.

Where the vapour pathway is only one of the exposure pathways considered, an additional approach can then be utilised as detailed within Section 4.12 of the CLEA model handbook⁽⁹⁾, which explains how to calculate an effective assessment criterion manually.

SR3⁽⁵⁾ states that, as a general rule of thumb, it is recognised that estimating vapour phase concentrations from dissolved and sorbed phase contamination by petroleum hydrocarbons are

at least a factor of ten higher than those likely to be measured on-site. RSK has therefore applied an empirical subsurface to indoor air correction factor of 10 into the CLEA model chemical database for all petroleum hydrocarbon fractions (including BTEX, trimethylbenzenes and the polycyclic aromatic hydrocarbons (PAH) naphthalene, acenaphthene and acenaphthylene) to reduce this conservatism.

Input selection

The most up-to-date published chemical and toxicological data was obtained from EA Report SC050021/SR7⁽¹⁰⁾, the EA TOX⁽¹⁾ reports, the C4SL SP1010 project report and associated appendices^(3,6), the 2015 LQM/CIEH report⁽⁷⁾ or the USEPA IRIS database⁽¹⁴⁾. Where a C4SL has been published, the RSK GAC have duplicated the C4SL published values using all input parameters within the SP1010 final project report⁽³⁾ and associated appendices⁽⁶⁾, and has adopted them as GAC for these six substances. Toxicological and specific chemical parameters for 1,2,4-trimethylbenzene, barium and methyl tertiary-butyl ether (MTBE) were obtained from the CLAIRÉ Soil Generic Assessment Criteria report⁽¹¹⁾.

For TPH, aromatic hydrocarbons C₅–C₈ were not modelled, as this range comprises benzene (□EC5-EC7) and toluene (□EC7-EC8), which are modelled separately.

Physical parameters

For the residential with home-grown produce scenario, the CLEA default building is a small, two-storey terrace house with a concrete ground-bearing slab. The house is assumed to have a 100m² private garden consisting of lawn and flowerbeds, incorporating a 20m² plot for growing fruit and vegetables consumed by the residents. SR3⁽⁵⁾ notes this residential building type to be the most conservative in terms of potential for vapour intrusion. The building parameters used in the production of the RSK GACs are the default CLEA v1.06 inputs presented in Table 3.3 of SR3⁽³⁾, with a dust loading factor detailed in Section 9.3 of SR3⁽⁵⁾. The parameters for a sandy loam soil type were used in line with Table 4.4 of SR3⁽⁵⁾. This includes a value of 6% for the percentage of soil organic matter (SOM) within the soil. In RSK's experience, this is rather high for many sites. To avoid undertaking site-specific risk assessments for SOM, RSK has produced an additional set of GAC for SOM of 1% and 2.5% for all substances using the CLEA tool.

Summary of modifications to the default CLEA SR3⁽⁵⁾ input parameters for residential with home-grown produce land-use scenario

In summary, the RSK GAC were produced using the default input parameters for soil properties, the air dispersion model, building properties and the vapour model detailed in SR3⁽⁵⁾. Modifications to the default SR3⁽⁵⁾ exposure scenarios based on the C4SL exposure scenarios⁽³⁾ are presented in Tables 2 and 3 below.

The final selected GAC are presented by pathway in Table 4 and the combined GAC in Table 5.

Figure 1: Conceptual model for residential scenario with home-grown produce

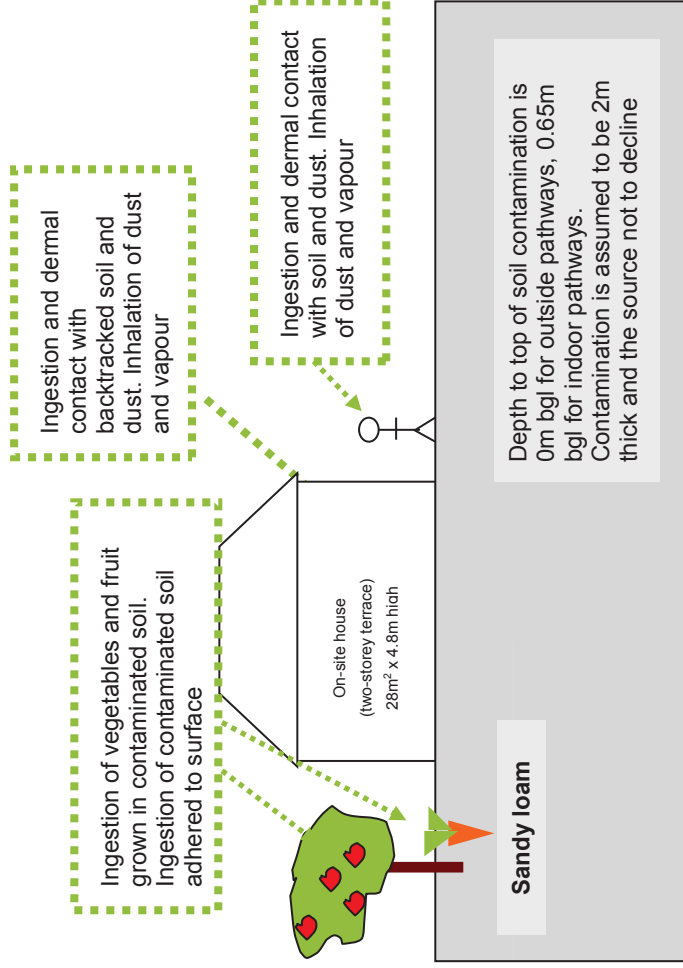


Table 1: Exposure assessment parameters for residential scenario with home-grown produce – inputs for CLEA model

Parameter	Value	Justification
Land use	Residential with homegrown produce	Chosen land use
Receptor	Female child age 1 to 6	Key generic assumption given in Box 3.1, SR3 ⁽⁵⁾
Building	Small terraced house	Key generic assumption given in Box 3.1, SR3. Small, two-storey terraced house chosen, as it is the most conservative residential building type in terms of protection from vapor intrusion (Section 3.4.6, SR3) ⁽⁵⁾
Soil type	Sandy Loam	Most common UK soil type (Section 4.3.1, from Table 3.1, SR3) ⁽⁵⁾
Start AC (age class)	1	Range of age classes corresponding to key generic assumption that the critical receptor is a young female child aged 0–6. From Box 3.1, SR3 ⁽⁵⁾
End AC (age class)	6	
SOM (%)	6	Representative of sandy loamy soil according to EA guidance note dated January 2009 entitled 'Changes We Have Made to the CLEA Framework Documents' ⁽¹³⁾
pH	1	To provide SAC for sites where SOM \geq 6% as often observed by RSK
	2.5	
	7	Model default

Table 2: Residential with home-grown produce – modified home-grown produce data

Name	Consumption rate 90 th percentile (g FW kg ⁻¹ BW day ⁻¹) by age class						Dry weight conversion factor (g DW g ⁻¹ FW)	Home-grown fraction (average)	Home-grown fraction (high end)	Soil loading factor (g g ⁻¹ DW)	Preparation correction factor
	1	2	3	4	5	6					
Green vegetables	7.12	5.87	5.87	5.87	4.53	4.53	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	10.7	2.83	2.83	2.83	2.14	2.14	0.103	0.06	0.4	1.00E-03	1.00E-00
Tuber vegetables	16	6.6	6.6	6.6	4.95	4.95	0.21	0.02	0.13	1.00E-03	1.00E-00
Herbaceous fruit	1.83	3.39	3.39	3.39	2.24	2.24	0.058	0.06	0.4	1.00E-03	6.00E-01
Shrub fruit	2.23	0.46	0.46	0.46	0.19	0.19	0.166	0.09	0.6	1.00E-03	6.00E-01
Tree fruit	3.82	10.3	10.3	10.3	5.16	5.16	0.157	0.04	0.27	1.00E-03	6.00E-01
Justification	Table 3.4, SP1010 ⁽³⁾						Table 6.3, SR3 ⁽⁵⁾	Table 4.19, SR3 ⁽⁵⁾		Table 6.3, SR3 ⁽⁵⁾	

Table 3: Residential with home-grown produce – modified and use and receptor data

Parameter	Unit	Age class					
		1	2	3	4	5	6
EF (soil and dust ingestion)	day yr ⁻¹	180	365	365	365	365	365
EF (consumption of home-grown produce)	day yr ⁻¹	180	365	365	365	365	365
EF (skin contact, indoor)	day yr ⁻¹	180	365	365	365	365	365
EF (skin contact, outdoor)	day yr ⁻¹	170	170	170	170	170	170
EF (inhalation of dust and vapour, indoor)	day yr ⁻¹	365	365	365	365	365	365
EF (inhalation of dust and vapour, outdoor)	day yr ⁻¹	365	365	365	365	365	365
Justification	Table 3.5, SP1010 ⁽³⁾ ; Table 3.1, SR3 ⁽⁵⁾						
Soil to skin adherence factor (outdoor)	mg cm ⁻² day ⁻¹	0.1	0.1	0.1	0.1	0.1	0.1
Justification	Table 3.5, SP1010 ⁽³⁾						
Inhalation rate	m ³ day ⁻¹	5.4	8.0	8.9/f	10.1	10.1	10.1
Justification	Mean value USEPA, 2011 ⁽¹²⁾ ; Table 3.2, SP1010 ⁽³⁾						
<p>Notes: For cadmium, the exposure assessment for a residential land use is based on estimates representative of lifetime exposure AC1-18. This is because the TDI_{oral} and TDI_{inh} are based on considerations of the kidney burden accumulated over 50 years. It is therefore reasonable to consider exposure not just in childhood but averaged over a longer period. See the Environment Agency Science Report SC05002/ TOX 3⁽¹⁾, Science Report SC050021/Cadmium SGV⁽¹⁾ and the project report SP1010⁽³⁾ for more information.</p>							

References

1. Environment Agency (2009), 'Science Reports SC050021 - SGV and TOX reports for benzene, toluene, ethylbenzene, xylene, mercury, selenium, nickel, arsenic, cadmium, phenol, dioxins, furans and dioxin-like PCBs'; 'Supplementary information for the derivation of SGV for benzene, toluene, ethylbenzene, xylene, mercury, selenium, nickel, arsenic, cadmium, phenol, dioxins, furans and dioxin-like PCBs', and 'Contaminants in soil: updated collation of toxicological data and intake values for humans benzene, toluene, ethylbenzene, xylene, mercury, selenium, nickel, arsenic, cadmium, phenol, dioxins, furans and dioxin-like PCBs'. Available at <https://www.gov.uk/government/publications/contaminants-in-soil-updated-collation-of-toxicological-data-and-intake-values-for-humans> and <https://www.gov.uk/government/publications/land-contamination-soil-guideline-values-sgvs> (accessed 4 February 2015)
2. Nathaniel, C. P., McCaffrey, C., Ashmore, M., Cheng, Q., Gillet, A. G., Ogden, R. C. and Scott, D. (2009), *LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment*, second edition (Nottingham Land Quality Press).
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GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITH HOME-GROWN PRODUCE

Table 4
Human Health Generic Assessment Criteria by Pathway for Residential With Home-Grown Produce Scenario

Compound	SAC Appropriate to Pathway SOM 1% (mg/kg)		Soil Saturation Limit (mg/kg)		SAC Appropriate to Pathway SOM 2.5% (mg/kg)		Soil Saturation Limit (mg/kg)		SAC Appropriate to Pathway SOM 6% (mg/kg)		Soil Saturation Limit (mg/kg)	
	Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Metals												
Arsenic	3.71E+01	5.26E+02	NR	NR	3.71E+01	5.26E+02	NR	NR	3.71E+01	5.26E+02	NR	NR
Barium	1.34E+03	NR	NR	NR	1.34E+03	NR	NR	NR	1.34E+03	NR	NR	NR
Beryllium	1.13E+02	1.72E+00	NR	NR	1.13E+02	1.72E+00	NR	NR	1.13E+02	1.72E+00	NR	NR
Boron	3.00E+02	5.20E+06	NR	NR	3.00E+02	5.20E+06	NR	NR	3.00E+02	5.20E+06	NR	NR
Cadmium	2.30E+01	4.88E+02	2.21E+01	NR	2.30E+01	4.88E+02	2.21E+01	NR	2.30E+01	4.88E+02	2.21E+01	NR
Chromium (III) - trivalent	1.84E+04	9.07E+02	NR	NR	1.84E+04	9.07E+02	NR	NR	1.84E+04	9.07E+02	NR	NR
Chromium (VI) - hexavalent	5.85E+01	2.06E+01	NR	NR	5.85E+01	2.06E+01	NR	NR	5.85E+01	2.06E+01	NR	NR
Copper	2.72E+03	1.41E+04	2.47E+03	NR	2.72E+03	1.41E+04	2.47E+03	NR	2.72E+03	1.41E+04	2.47E+03	NR
Lead	2.01E+02	NR	NR	NR	2.01E+02	NR	NR	NR	2.01E+02	NR	NR	NR
Elemental Mercury (Hg ⁰)	NR	2.35E-01	NR	4.31E+00	NR	5.60E-01	NR	1.07E+01	NR	1.22E+00	NR	2.59E+01
Inorganic Mercury (Hg ²⁺)	3.95E+01	3.63E+03	3.91E+01	NR	3.95E+01	3.63E+03	3.91E+01	NR	3.95E+01	3.63E+03	3.91E+01	NR
Methyl Mercury (Hg ¹⁺)	1.26E+01	1.87E+01	7.33E+00	7.33E+01	1.26E+01	1.87E+01	9.34E+00	1.42E+02	1.26E+01	1.87E+01	1.08E+01	3.04E+02
Nickel	1.27E+02	1.81E+02	NR	NR	1.27E+02	1.81E+02	NR	NR	1.27E+02	1.81E+02	NR	NR
Selenium	2.58E+02	NR	NR	NR	2.58E+02	NR	NR	NR	2.58E+02	NR	NR	NR
Vanadium	4.13E+02	1.46E+03	NR	NR	4.13E+02	1.46E+03	NR	NR	4.13E+02	1.46E+03	NR	NR
Zinc	3.86E+03	3.63E+07	NR	NR	3.86E+03	3.63E+07	NR	NR	3.86E+03	3.63E+07	NR	NR
Cyanide (free)	1.37E+00	1.37E+04	1.37E+00	NR	1.37E+00	1.37E+04	1.37E+00	NR	1.37E+00	1.37E+04	1.37E+00	NR
Volatile Organic Compounds												
Benzene	2.62E-01	9.01E-01	2.03E-01	1.22E+03	5.39E-01	1.68E+00	4.08E-01	2.26E+03	1.16E+00	3.48E+00	8.72E-01	4.71E-03
Toluene	1.53E+02	9.08E+02	1.31E-02	8.69E+02	3.49E+02	2.00E+03	2.97E+02	1.92E+03	7.95E+02	4.55E+03	6.77E+02	4.36E+03
Ethylbenzene	1.10E+02	8.34E+01	4.74E-01	5.18E+02	2.61E+02	1.96E+02	1.12E+02	1.22E+03	6.00E+02	4.58E+02	2.60E+02	2.84E+03
Xylene - m	2.10E+02	8.25E+01	5.92E+01	6.25E+02	5.01E+02	1.95E+02	1.40E+02	1.47E+03	1.15E+03	4.56E+02	3.27E+02	3.48E+03
Xylene - o	1.92E+02	8.73E+01	6.07E-01	4.78E+02	4.56E+02	2.08E+02	1.43E+02	1.12E+03	1.05E+03	4.86E+02	3.32E+02	2.62E+03
Xylene - p	1.92E+02	7.93E+01	5.66E+01	5.76E+02	4.70E+02	1.86E+02	1.33E+02	1.35E+03	1.08E+03	4.36E+02	3.10E+02	3.17E+03
Toluene	1.92E+02	7.93E+01	5.66E+01	5.76E+02	4.56E+02	1.86E+02	1.33E+02	1.47E+03	1.05E+03	4.36E+02	3.10E+02	3.48E+03
Methyl tertiary-Butyl ether (MTBE)	1.54E+02	1.04E+02	6.22E+01	2.04E+04	2.97E+02	1.69E+02	1.08E+02	3.31E+04	3.21E+02	2.10E+02	6.27E+04	NR
1,1,1,2-Tetrachloroethane	5.39E+00	1.54E+00	1.20E+00	2.60E+03	1.27E+01	3.58E+00	2.78E+00	6.02E+03	2.92E+01	8.29E+00	6.46E+00	1.40E+04
1,1,2,2-Tetrachloroethane	2.81E+00	3.92E+00	1.64E+00	2.67E+03	6.10E+00	8.04E+00	3.47E+00	5.46E+03	1.96E+01	1.76E+01	7.67E+00	1.20E+04
1,1,1-Trichloroethane	3.33E+02	9.01E+00	8.77E+00	1.43E+03	7.26E+02	1.84E+01	1.80E+01	2.92E+03	1.62E+03	4.04E+01	3.94E+01	6.39E+03
1,1,2-Trichloroethane	1.95E+00	1.25E+00	7.62E+01	4.03E+03	4.21E+00	2.55E+00	1.59E+00	8.21E+03	9.95E+00	5.59E+00	3.50E+00	1.80E+04
1,1-Dichloroethane	1.93E+01	3.29E+01	3.23E+01	2.23E+03	3.85E+01	5.82E+01	5.74E+01	3.94E+03	8.15E+01	1.17E+00	1.16E+00	7.94E+03
1,2-Dichloroethane	3.17E+02	9.20E+03	7.13E+03	3.41E+03	5.73E+02	1.38E+02	1.08E+02	4.91E+03	1.09E+01	2.28E+02	1.88E+02	8.43E+03
1,2,4-Trimethylbenzene	NR	1.76E+00	NR	4.74E+02	NR	4.28E+00	NR	1.16E+03	NR	9.72E+00	NR	2.76E+03
1,3,5-Trimethylbenzene	NR	NR	NR	2.30E+02	NR	NR	NR	5.52E+02	NR	NR	NR	1.30E+03
1,2-Dichloropropane	4.28E+00	3.40E+02	3.37E+02	1.19E+03	8.44E+00	6.00E+02	5.96E+02	2.11E+03	1.77E+01	1.21E+01	4.24E+03	7.54E+03
Carbon Tetrachloride (tetrachloromethane)	3.10E+00	2.58E+02	2.57E+02	1.52E+03	7.11E+00	5.65E+02	5.62E+02	3.32E+03	1.62E+01	1.28E+01	1.27E+01	7.54E+03
Chloroethane	NR	1.17E+01	NR	2.61E+03	NR	1.59E+01	NR	3.54E+03	NR	2.57E+01	NR	5.71E+03
Chloromethane	NR	1.17E+02	NR	1.91E+03	NR	1.38E+02	NR	2.24E+03	NR	1.85E+02	NR	2.99E+03
Cis 1,2-Dichloroethane	1.56E+01	NR	NR	3.94E+03	2.66E+01	NR	NR	6.61E+03	5.18E+01	NR	NR	1.29E+04
Dichloromethane	7.04E+01	3.05E+00	6.24E+01	7.27E+03	1.27E+03	4.08E+00	1.08E+00	9.68E+03	2.33E+00	6.42E+00	1.92E+00	1.53E+04
Tetrachloroethane	4.49E+00	1.79E+01	1.76E+01	4.24E+02	1.04E+01	4.02E+01	3.94E+01	9.51E+02	2.98E+01	9.21E+01	9.04E+01	2.18E+03
Trans 1,2-Dichloroethane	6.45E+00	2.76E+01	NR	3.42E+03	1.29E+01	4.99E+01	NR	6.17E+03	2.74E+01	1.02E+00	NR	1.28E+04
Trichloroethane	2.83E+01	1.72E+02	1.62E+02	1.54E+03	6.26E+01	3.59E+02	3.40E+02	3.22E+03	1.41E+00	7.88E+02	7.55E+02	7.14E+03
Vinyl Chloride (chloroethene)	3.82E+03	7.73E+04	6.43E+04	1.36E+03	6.87E+03	1.00E+03	8.73E+04	1.76E+03	1.25E+02	1.53E+03	1.36E+03	2.69E+03
Semi-Volatile Organic Compounds												
2-Chloronaphthalene	2.76E+02	5.39E+00	5.29E+00	1.14E+02	6.59E+02	1.33E+01	1.30E+01	2.90E+02	1.45E+03	3.17E+01	3.10E+01	6.69E+02
Acenaphthene	2.27E+02	4.86E+04	2.26E+02	5.70E+01	5.41E+02	1.18E+05	5.38E+02	1.41E+02	1.18E+03	2.66E+05	1.17E+03	3.36E+02
Acenaphthylene	1.85E+02	4.59E+04	1.84E+02	8.61E+01	4.42E+02	1.11E+05	4.40E+02	2.12E+02	9.78E+02	2.53E+05	9.74E+02	5.08E+02
Anthracene	2.43E+03	1.53E+05	2.39E+03	1.17E+00	5.53E+03	3.77E+05	5.45E+03	2.91E+00	1.10E+04	8.76E+05	1.09E+04	6.96E+00



GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITH HOME-GROWN PRODUCE

Table 4
Human Health Generic Assessment Criteria by Pathway for Residential With Home-Grown Produce Scenario

Compound	Notes	SAC Appropriate to Pathway SOM 1% (mg/kg)		Soil Saturation Limit (mg/kg)		SAC Appropriate to Pathway SOM 2.5% (mg/kg)		Soil Saturation Limit (mg/kg)		SAC Appropriate to Pathway SOM 6% (mg/kg)		Soil Saturation Limit (mg/kg)		
		Oral	Inhalation	Combined	Oral	Inhalation	Combined	Oral	Inhalation	Combined	Oral	Inhalation	Combined	Oral
Benzol(a)anthracene		1.01E+01	2.47E+01	7.18E+00	1.77E+00	4.37E+01	1.07E+01	4.28E+00	1.89E+01	6.26E+01	1.93E+01	1.03E+01		
Benzol(a)pyrene	(a)	4.96E+00	3.51E+01	NR	9.11E+01	3.77E+01	NR	2.28E+00	4.96E+00	3.89E+01	NR	5.46E+00		
Benzol(b)fluoranthene		2.96E+00	1.93E+01	2.66E+00	1.22E+00	3.89E+00	3.29E+00	3.04E+00	4.43E+00	2.22E+01	3.69E+00	7.29E+00		
Benzol(k)fluoranthene		3.77E+02	1.87E+03	3.14E+02	1.56E+02	4.09E+02	3.88E+02	3.85E+02	4.23E+02	1.97E+03	3.48E+02	9.23E+02		
Chrysene		8.92E+01	5.41E+02	7.66E+01	6.87E+01	1.10E+02	9.22E+01	1.72E+02	3.19E+01	5.91E+02	1.00E+02	4.12E+00		
Dibenzol(a,h)anthracene		1.66E+01	1.19E+02	1.46E+01	4.40E+01	2.64E+01	2.17E+01	1.10E+00	3.19E+01	1.66E+02	2.67E+01	2.64E+00		
Fluoranthene		2.90E+01	1.45E+00	2.41E+01	3.93E+03	3.43E+01	2.84E+01	9.82E+03	3.69E+01	1.74E+00	3.04E+01	2.39E+02		
Fluoranthene		2.87E+02	3.83E+04	2.85E+02	1.89E+01	5.63E+02	5.60E+02	4.73E+01	9.00E+02	1.83E+05	8.96E+02	1.13E+02		
Hexachloroethane		1.77E+02	6.20E+03	1.72E+02	3.09E+01	4.19E+02	4.07E+02	7.65E+01	8.99E+02	3.62E+04	8.77E+02	1.83E+02		
Indeno(1,2,3-cd)pyrene		2.68E+01	NR	NR	8.17E+00	6.57E+01	NR	2.01E+01	1.95E+00	NR	NR	4.81E+01		
Naphthalene		3.09E+01	2.12E+02	2.70E+01	6.13E+02	4.22E+01	3.59E+01	1.53E+01	4.92E+01	2.50E+02	4.11E+01	3.68E+01		
Phenanthrene		2.78E+01	2.93E+01	1.27E+01	7.64E+01	6.66E+01	3.04E+01	1.83E+02	1.59E+02	1.31E+02	7.06E+01	4.32E+02		
Pyrene		9.85E+01	7.17E+03	9.22E+01	3.60E+01	2.24E+02	2.22E+02	8.96E+01	4.48E+02	4.07E+04	4.43E+02	2.14E+02		
Phenol		6.25E+02	8.79E+04	6.20E+02	2.20E+00	1.25E+03	1.24E+03	5.49E+00	2.05E+03	4.23E+05	2.04E+03	1.32E+01		
Phenol		1.60E+02	4.58E+02	1.20E+02	2.42E+04	2.96E+02	2.09E+02	3.91E+04	5.86E+02	1.19E+03	3.93E+02	7.03E+04		

Total Petroleum Hydrocarbons

Aliphatic hydrocarbons >EC ₉ -EC ₆	4.99E+03	4.24E+01	4.23E+01	3.04E+02	1.13E+04	7.79E+01	7.78E+01	5.58E+02	2.50E+04	1.61E+02	1.60E+02	1.15E+03
Aliphatic hydrocarbons >EC ₈ -EC ₆	1.49E+04	1.04E+02	1.03E+02	1.44E+02	3.43E+04	2.31E+02	2.31E+02	3.22E+02	7.11E+04	5.29E+02	5.28E+02	7.38E+02
Aliphatic hydrocarbons >EC ₇ -EC ₁₀	1.61E+03	2.68E+01	2.67E+01	7.77E+01	2.91E+03	6.59E+01	6.51E+01	1.90E+02	4.26E+03	1.56E+02	1.54E+02	4.51E+02
Aliphatic hydrocarbons >EC ₁₀ -EC ₁₂	4.57E+03	1.33E+02	1.32E+02	4.75E+01	5.51E+03	3.31E+02	3.26E+02	1.18E+02	5.98E+03	7.93E+02	7.85E+02	2.83E+02
Aliphatic hydrocarbons >EC ₁₂ -EC ₁₆	6.27E+03	1.11E+03	1.06E+03	2.37E+01	6.34E+03	2.78E+03	2.41E+03	5.91E+01	6.36E+03	6.67E+03	4.34E+03	1.42E+02
Aliphatic hydrocarbons >EC ₁₆ -EC ₃₅	(b)	6.46E+04	NR	NR	8.48E+00	9.17E+04	NR	2.12E+01	1.10E+05	NR	NR	5.09E+01
Aliphatic hydrocarbons >EC ₃₅ -EC ₄₄	(b)	6.46E+04	NR	NR	8.48E+00	9.17E+04	NR	2.12E+01	1.10E+05	NR	NR	5.09E+01
Aromatic hydrocarbons >EC8-EC10		5.76E+01	4.74E+01	3.45E+01	6.13E+02	1.18E+02	8.38E+01	1.50E+03	3.07E+02	2.77E+02	1.94E+02	3.58E+02
Aromatic hydrocarbons >EC10-EC12		8.29E+01	2.58E+02	7.52E+01	3.64E+02	1.96E+02	1.79E+02	8.99E+02	4.25E+02	1.52E+03	3.91E+02	2.15E+03
Aromatic hydrocarbons >EC12-EC16		1.47E+02	2.85E+03	1.45E+02	1.69E+02	3.36E+02	3.32E+02	4.19E+02	6.81E+02	1.88E+04	6.74E+02	1.00E+03
Aromatic hydrocarbons >EC16-EC21	(b)	2.63E+02	NR	NR	5.37E+01	5.45E+02	NR	NR	9.34E+02	NR	NR	3.21E+02
Aromatic hydrocarbons >EC21-EC26	(b)	1.09E+03	NR	NR	4.83E+00	1.47E+03	NR	1.21E+01	1.70E+03	NR	NR	2.90E+01
Aromatic hydrocarbons >EC35-EC44	(b)	1.09E+03	NR	NR	4.83E+00	1.47E+03	NR	1.21E+01	1.70E+03	NR	NR	2.90E+01

Notes:

EC - equivalent carbon. SAC - soil assessment criteria.

The CLEA model output is colour coded depending upon whether the soil saturation limit has been exceeded.

Calculated SAC exceeds soil saturation limit but the exceedance will not affect the interpretation of any exceedances as the contribution of the indoor and outdoor vapour pathway to total exposure is >10%.
Calculated SAC does not exceed the soil saturation limit.

Calculated SAC exceeds soil saturation limit but the exceedance will not affect the interpretation of any exceedances as the contribution of the indoor and outdoor vapour pathway to total exposure is >10%.

Calculated SAC does not exceed the soil saturation limit.

The SAC for organic compounds are dependant upon soil organic matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58. 1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.
SAC for TPH fractions, PAHs naphthalene, acenaphthylene, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway (Section 10.1.1, SRF)

(a) SAC for arsenic, benzene, benzo(a)pyrene, cadmium, chromium VI and lead are derived using the C4SL toxicology data.

(b) SAC for boron and selenium should not include the inhalation pathway as no expert group HCV has been derived; aliphatic and aromatic hydrocarbons >EC16 should not include inhalation pathway due to their non-volatile nature and inhalation exposure being minimal (oral, dermal and inhalation exposure is compared to the oral HCV); arsenic should only be based on oral contribution (rather than combined) owing to the relative small contribution from inhalation in accordance with the SGV report. The Oral SAC should be adopted for zinc and benzo(a)pyrene.

(c) SAC for CrIII should be based on the lower of the oral and inhalation SAC (see LQM/CIERH 2015 Section 6.8)

(d) SAC for elemental mercury, chromium VI and nickel should be based on the inhalation pathway only.

(e) SAC for 1,3,5-trimethylbenzene is not recorded owing to the lack of toxicological data. SAC for 1,2,4-trimethylbenzene may be used.

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITH HOME-GROWN PRODUCE



Table 5
Human Health Generic Assessment Criteria for Residential with home-grown produce

Compound	SAC for Soil SOM 1% (mg/kg)	SAC for Soil SOM 2.5% (mg/kg)	SAC for Soil SOM 6% (mg/kg)
Metals			
Arsenic	37	37	37
Barium	1,300	1,300	1,300
Beryllium	1.7	1.7	1.7
Boron	300	300	300
Cadmium	22	22	22
Chromium (III) - trivalent	910	910	910
Chromium (VI) - hexavalent	21	21	21
Copper	2,500	2,500	2,500
Lead	200	200	200
Elemental Mercury (Hg ⁰)	0.2	0.6	1.2
Inorganic Mercury (Hg ²⁺)	39	39	39
Methyl Mercury (Hg ²⁺)	10	10	10
Nickel	130	130	130
Selenium	258	258	258
Vanadium	410	410	410
Zinc	3,900	3,900	3,900
Cyanide (free)	1.4	1.4	1.4
Volatile Organic Compounds			
Benzene	0.20	0.41	0.87
Toluene	130	300	680
Ethylbenzene	50	110	260
Xylene - m	59	140	327
Xylene - o	61	143	332
Xylene - p	57	133	310
Total xylene	57	133	310
Methyl tertiary-Butyl ether (MTBE)	60	110	210
1,1,1,2-Tetrachloroethane	1.20	2.78	6.46
1,1,2,2-Tetrachloroethane	1.6	3.5	7.7
1,1,1-Trichloroethane	9	18	39
1,1,2-Trichloroethane	0.8	1.6	3.5
1,1-Dichloroethane	0.32	0.57	1.16
1,2-Dichloroethane	0.007	0.011	0.019
1,2,4-Trimethylbenzene	1.8	4.3	9.7
1,3,5-Trimethylbenzene	NR	NR	NR
1,2-Dichloropropane	0.034	0.060	0.120
Carbon Tetrachloride (tetrachloromethane)	0.026	0.056	0.127
Chloroethane	11.7	15.9	25.7
Chloromethane	0.012	0.014	0.019
Cis 1,2 Dichloroethene	0.16	0.27	0.52
Dichloromethane	0.62	1.08	1.92
Tetrachloroethene	0.2	0.4	0.9
Trans 1,2 Dichloroethene	0.28	0.50	1.02
Trichloroethene	0.02	0.03	0.08
Vinyl Chloride (chloroethene)	0.0006	0.0009	0.0014
Semi-Volatile Organic Compounds			
2-Chloronaphthalene	5	13	31
Acenaphthene	230	540	1,170
Acenaphthylene	180	440	970
Anthracene	2,400	5,500	10,900
Benzo(a)anthracene	7	11	13
Benzo(a)pyrene	5	5	5
Benzo(b)fluoranthene	2.6	3.3	3.7
Benzo(g,h,i)perylene	310	340	350
Benzo(k)fluoranthene	77	92	100
Chrysene	15	22	27
Dibenzo(a,h)anthracene	0.24	0.28	0.30
Fluoranthene	290	560	900
Fluorene	170	410	880
Hexachloroethane	0.27	0.66	1.55
Indeno(1,2,3-cd)pyrene	27	36	41
Naphthalene	13	30	71
Phenanthrene	100	220	440
Pyrene	620	1,240	2,040
Phenol	120	210	390
Total Petroleum Hydrocarbons			
Aliphatic hydrocarbons EC ₃ -EC ₆	42	78	160
Aliphatic hydrocarbons >EC ₆ -EC ₈	100	230	530
Aliphatic hydrocarbons >EC ₈ -EC ₁₀	27	65	154
Aliphatic hydrocarbons >EC ₁₀ -EC ₁₂	130 (48)	330 (118)	760 (283)
Aliphatic hydrocarbons >EC ₁₂ -EC ₁₆	1,100 (24)	2,400 (59)	4,300 (142)
Aliphatic hydrocarbons >EC ₁₆ -EC ₃₅	65,000 (8)	92,000 (21)	110,000
Aliphatic hydrocarbons >EC ₃₅ -EC ₄₄	65,000 (8)	92,000 (21)	110,000
Aromatic hydrocarbons >EC ₈ -EC ₁₀	30	80	190
Aromatic hydrocarbons >EC ₁₀ -EC ₁₂	80	180	390
Aromatic hydrocarbons >EC ₁₂ -EC ₁₆	140	330	670
Aromatic hydrocarbons >EC ₁₆ -EC ₂₁	260	540	930
Aromatic hydrocarbons >EC ₂₁ -EC ₃₅	1,100	1,500	1,700
Aromatic hydrocarbons >EC ₃₅ -EC ₄₄	1,100	1,500	1,700
Minerals			
Asbestos	Stage 1 test – No asbestos detected with ID; Stage 2 test - <0.001% dry weight (exceedance of either equates to an exceedance of the GAC) ¹		
Notes:			
* - Generic assessment criteria not calculated owing to low volatility of substance and therefore no pathway, or an absence of toxicological data.			
NR - SAC for 1,3,5-trimethylbenzene is not recorded owing to the lack of toxicological data, SAC for 1,2,4-trimethylbenzene may be used			
EC - equivalent carbon. SAC - soil assessment criteria.			
¹ LOD for weight of asbestos per unit weight of soil calculated on a dry weight basis using PLM, handpicking and gravimetry.			
The SAC for organic compounds are dependent on Soil Organic Matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58. 1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.			
SAC for TPH fractions, PAHs naphthalene, acenaphthene and acenaphthylene, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway, section 10.1.1, SR3.			
(VALUE IN BRACKETS)			
RSK has adopted an approach for petroleum hydrocarbons in accordance with LQM/CIH whereby the concentration modelled for each petroleum hydrocarbon fraction has been tabulated as the SAC with the corresponding solubility or vapour saturation limits given in brackets.			



APPENDIX N

GENERIC ASSESSMENT CRITERIA FOR PHYTOTOXIC EFFECTS

Several compounds can inhibit plant growth; hence it is important to have generic assessment criteria (GAC) to promote healthy plant growth. In the absence of other published GAC, the GAC have been obtained from legislation (UK and European) and guidance related to the use of sewage sludge on agricultural fields.

The Council of European Communities Sewage Sludge Directive (86/278/EEC) dated 1986, has been transposed into UK law by Statutory Instrument No. 1263, The Sludge (use in Agriculture) Regulations 1989 (Public Health England, Wales and Scotland), as amended in 1990 and The Sludge (use in Agriculture) Regulations (Northern Ireland) SR No, 245, 1990. In addition the Department of Environment (DoE) produced a Code of Practice (CoP) (Updated 2nd Edition) in 2006 which provided guidance on the application of sewage sludge on agricultural land (however the status of this document is unclear as it is on the archive section of the Defra website).

The directive seeks to encourage the use of sewage sludge in agriculture and to regulate its use in such a way as to “**prevent harmful effects on soil, vegetation, animals and man**”. To this end, it prohibits the use of untreated sludge on agricultural land unless it is injected or incorporated into the soil. Treated sludge is defined as having undergone “biological, chemical or heat treatment, long-term storage or any other appropriate process so as significantly to reduce its fermentability and the health hazards resulting from its use”. To provide protection against potential health risks from residual pathogens, sludge must not be applied to soil in which fruit and vegetable crops are growing, or less than ten months before fruit and vegetable crops are to be harvested. Grazing animals must not be allowed access to grassland or forage land less than three weeks after the application of sludge.

The specified limits of concentrations of selected elements in soil are presented in Table 4 of the updated 2nd Edition of the DoE Code of Practice and are designed to protect plant growth. It is noted that these values are more stringent than the values set in current UK regulations. However since they were amended following recommendations from the Independent Scientific Committee in 1993. (MAFF/DOE 1993). The GAC are presented in Table 1.



Table 1: Generic assessment criteria

Determinant	Generic assessment criteria (mg/kg)			
	pH 5.0 < 5.5	pH 5.5 < 6.0	pH 6.0 < 7.0	pH >7.0
Zinc	200	200	200	300
Copper	80	100	135	200
Nickel	50	60	75	110
Lead	300	300	300	300
Cadmium	3	3	3	3
Mercury	1	1	1	1

Note: Only compounds with assessment criteria documented within the Directive 86/278/EEC have been included, although criteria for 5 additional compounds have been presented within the 2006 CoP.



APPENDIX O

GENERIC ASSESSMENT CRITERIA FOR POTABLE WATER SUPPLY PIPES

A range of pipe materials is available and careful selection, design and installation is required to ensure that water supply pipes are satisfactorily installed and meet the requirements of the Water Supply (Water Fittings) Regulations 1999 in England and Wales, the Byelaws 2000 in Scotland and the Northern Ireland Water Regulations. The regulations include a requirement to use only suitable materials when laying water pipes and laying water pipes without protection is not permitted at contaminated sites. The water supply company has a statutory duty to enforce the regulations.

Contaminants in the ground can pose a risk to human health by permeating potable water supply pipes. To fulfil their statutory obligation, UK water supply companies require robust evidence from developers to demonstrate either that the ground in which new plastic supply pipes will be laid is free from specific contaminants, or that the proposed remedial strategy will mitigate any existing risk. If these requirements cannot be demonstrated to the satisfaction of the relevant water company, it becomes necessary to specify an alternative pipe material on the whole development or in specific zones.

In 2010, UK Water Industry Research (UKWIR) published *Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites* (Report Ref. No. 10/WM/03/21). This report reviewed previously published industry guidelines and threshold concentrations adopted by individual water supply companies.

The focus of the UKWIR research project was to develop clear and concise procedures, which provide consistency in the pipe selection decision process. It was intended to provide guidance that can be used to ensure compliance with current regulations and to prevent water supply pipe failing prematurely due to the presence of contamination.

The report concluded that in most circumstances only organic contaminants pose a potential risk to plastic pipe materials and Table 3.1 of the report provides threshold concentrations for polyethylene (PE) and polyvinyl chloride (PVC) pipes for the organic contaminants of concern. The report also makes recommendations for the procedures to be adopted in the design of site investigations and sampling strategies, and the assessment of data, to ensure that the ground through which water supply pipes will be laid is adequately characterised.

Risks to water supply pipes have therefore been assessed against the threshold concentrations for PE and PVC pipe specified in Table 3.1 of Report 10/WM/03/21, which have been adopted as the GAC for this linkage and are reproduced in Table A3 below.

Since water supply pipes are typically laid at a minimum depth of 0.75 m below finished ground levels, sample results from depths between 0.5 m and 1.5 m below finished level are generally considered suitable for assessing risks to water supply. Samples outside these depths can be used, providing the stratum is the same as that in which water supply pipes are likely to be located. The report specifies that sampling should characterise the ground conditions to a minimum of 0.5 m below the proposed depth of the pipe.



It should be noted that the assessment provided in this report is a guide and the method of assessment and recommendations should be checked with the relevant water supply company.

Table Q1: Generic assessment criteria for water supply pipes

		Pipe material	
		GAC (mg/kg)	
	Parameter group	PE	PVC
1	Extended VOC suite by purge and trap or head space and GC-MS with TIC (Not including compounds within group 1a)	0.5	0.125
1a	<ul style="list-style-type: none"> BTEX + MTBE 	0.1	0.03
2	SVOCs TIC by purge and trap or head space and GC-MS with TIC (aliphatic and aromatic C ₅ –C ₁₀) (Not including compounds within group 2e and 2f)	2	1.4
2e	<ul style="list-style-type: none"> Phenols 	2	0.4
2f	<ul style="list-style-type: none"> Cresols and chlorinated phenols 	2	0.04
3	Mineral oil C ₁₁ –C ₂₀	10	Suitable
4	Mineral oil C ₂₁ –C ₄₀	500	Suitable
5	Corrosive (conductivity, redox and pH)	Suitable	Suitable
Specific suite identified as relevant following site investigation			
2a	Ethers	0.5	1
2b	Nitrobenzene	0.5	0.4
2c	Ketones	0.5	0.02
2d	Aldehydes	0.5	0.02
6	Amines	Not suitable	Suitable
Notes: where indicated as 'suitable', the material is considered resistant to permeation or degradation and no threshold concentration has been specified by UKWIR.			



APPENDIX P

GQRA DATA SCREENING TABLES – SOILS

Project name	Birdwell
Project code	350283
Client name	Hanworth
Address	Hay Green Lane Birdwell
NGR	
Land use	Residential with home-grown produce
SOM	6%
GAC version	2019_00

Lab sample ID 20/0617/21 20/01041/1 20/01041/4 20/01041/5 20/01041/6 20/01041/7 20/01041/9 20/01041/10 20/01041/11 20/01041/13

Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	Depth to top		TP01	TP02	TP03	TP04	TP04	TP05	TP06	TP06	TP07		
								17/07/20	29/01/20											
									Client sample ID											
									HP09	TP01	TP02	TP03	TP04	TP04	TP05	TP06	TP06	TP07		
									0.05	0.1	0.3	0.3	0.3	0.3	0.3	1	0.1	0.6	1.2	
									Date sampled											
									# Non-date											
Metals and Inorganics																				
Arsenic	mg/kg	37		50	1	28	0	8	11											
Cadmium	mg/kg	22		1.8	0.6	28	28	0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1		
Chromium	mg/kg	910		887	17	28	28	0	36	23	28	28	20	24	25	25	23	23		
Copper	mg/kg	2500		155	8	28	28	0	69	25	28	28	8	66	19	16	69	69		
Lead	mg/kg	200		354	12	28	28	0	185	54	28	28	27	51	16	16	69	69		
Mercury	mg/kg	39		1.2	0.68	28	8	20	0.34	<0.17	<0.17	<0.17	<0.17	<0.17	0.19	0.19	0.19	0.19		
Nickel	mg/kg	130		42	13	28	28	0	19	22	28	28	42	26	35	16	16	16		
Selenium	mg/kg	258		5	<1	28	22	6	2	2	2	2	5	<1	<1	2	2	2		
Zinc	mg/kg	3900		597	39	28	28	0	403	106	28	28	96	166	68	105	105	105		
Asbestos																				
Asbestos in soil							21	0	21	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD		
Petroleum Hydrocarbons																				
Ali >C5-C6	mg/kg	160		<0.01	<0.01	8	0	8	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Ali >C6-C8	mg/kg	530		<0.01	<0.01	8	0	8	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Ali >C8-C10	mg/kg	154		3	<1	8	1	7	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
Ali >C10-C12	mg/kg	760		283	1	8	1	7	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
Ali >C12-C16	mg/kg	4300		142	3	8	1	7	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
Ali >C16-C21	mg/kg			4	<1	8	1	7	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
Ali >C21-C35	mg/kg	21		21	2	8	8	0	8	8	8	8	5	5	9	9	9	9		
Ali >C16-C35 calculated	mg/kg	110000		25	2	8	8	0	8	8	8	8	5	5	9	9	9	9		
Total Aliphatics	mg/kg	32		32	2	8	8	0	8	8	8	8	5	5	9	9	9	9		
Aro >C5-C7	mg/kg			<0.01	<0.01	8	0	8	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Aro >C7-C8	mg/kg			<0.01	<0.01	8	0	8	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Aro >C8-C10	mg/kg	190		4	<1	8	2	6	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
Aro >C10-C12	mg/kg	390		4	<1	8	1	7	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
Aro >C12-C16	mg/kg	670		14	<1	8	6	2	3	3	8	8	2	2	3	3	3	3		
Aro >C16-C21	mg/kg	930		45	<1	8	7	1	8	8	8	8	11	11	16	16	16	16		
Aro >C21-C35	mg/kg	1700		107	5	8	8	0	50	50	59	59	42	42	19	19	19	19		
Total Aromatics	mg/kg	174		174	5	8	8	0	59	59	59	59	42	42	19	19	19	19		
TPH (Ali & Aro)	mg/kg	206		206	7	8	8	0	67	67	67	67	47	47	28	28	28	28		
BTEX - Benzene	mg/kg	0.87		<0.01	<0.01	8	0	8	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
BTEX - Toluene	mg/kg	680		<0.01	<0.01	8	0	8	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
BTEX - Ethyl Benzene	mg/kg	260		<0.01	<0.01	8	0	8	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
BTEX - o Xylene	mg/kg	332		<0.01	<0.01	8	0	8	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
BTEX - m & p Xylene	mg/kg	310		<0.01	<0.01	8	0	8	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
MTBE	mg/kg	210		<0.01	<0.01	8	0	8	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Polycyclic aromatic hydrocarbons																				
Acenaphthene	mg/kg	1170		0.17	<0.01	20	9	11	0.01	0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01		
Acenaphthylene	mg/kg	970		0.18	<0.01	20	6	14	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01		
Anthracene	mg/kg	10900		0.84	<0.02	20	9	11	0.04	0.04	<0.02	<0.02	0.07	<0.02	<0.02	<0.02	<0.02	<0.02		
Benzo(a)anthracene	mg/kg	13		3.1	<0.04	20	14	6	0.19	0.19	<0.04	<0.04	0.39	<0.04	<0.04	<0.04	<0.04	<0.04		
Benzo(a)pyrene	mg/kg	5		2.72	<0.04	20	14	6	0.16	0.16	<0.04	<0.04	0.31	<0.04	<0.04	<0.04	<0.04	<0.04		
Benzo(b)fluoranthene	mg/kg	3.7		2.76	<0.05	20	14	6	0.23	0.23	<0.05	<0.05	0.4	<0.05	<0.05	<0.05	<0.05	<0.05		

Project name	Birdwell
Project code	350283
Client name	Hanworth
Address	Hay Green Lane Birdwell
NGR	
Land use	Residential with home-grown produce
SOM	6%
GAC version	2019_00

Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	Date sampled		Depth to top	Depth to bottom	17/07/20	17/07/20
								# Non-dete					
Metals and Inorganics													
Arsenic	mg/kg	37		50	1	28	28	0	10	0	0.6	0.6	1
Cadmium	mg/kg	22		1.8	0.6	28	28	0	0.8	0	0.8	0.7	0.7
Chromium	mg/kg	910	21	887	17	28	28	0	25	23	23	23	23
Copper	mg/kg	2500		155	8	28	28	0	39	17	17	17	17
Lead	mg/kg	200		354	12	28	28	0	85	22	22	22	22
Mercury	mg/kg	39		1.2	0.68	28	28	8	20	<0.17	<0.17	<0.17	<0.17
Nickel	mg/kg	130		42	13	28	28	0	19	21	21	21	21
Selenium	mg/kg	258		5	<1	28	22	6	2	2	2	2	2
Zinc	mg/kg	3900		597	39	28	28	0	211	97	97	97	97
Asbestos													
Asbestos in soil						21	0	21	NAD				
Petroleum Hydrocarbons													
Ali >C5-C6	mg/kg	160		<0.01	<0.01	8	0	8	<0.01	8	<0.01	8	<0.01
Ali >C6-C8	mg/kg	530		<0.01	<0.01	8	0	8	<0.01	8	<0.01	8	<0.01
Ali >C8-C10	mg/kg	154		3	<1	8	1	7	<1	7	<1	7	<1
Ali >C10-C12	mg/kg	760	283	1	<1	8	1	7	<1	7	<1	7	<1
Ali >C12-C16	mg/kg	4300	142	3	<1	8	1	7	<1	7	<1	7	<1
Ali >C16-C21	mg/kg			4	<1	8	1	7	<1	7	<1	7	<1
Ali >C21-C35	mg/kg			21	2	8	8	0	3	3	3	3	3
Ali >C16-C35 calculated	mg/kg	110000		25	2	8	8	0	3	3	3	3	3
Total Aliphatics	mg/kg			32	2	8	8	0	3	3	3	3	3
Aro >C5-C7	mg/kg			<0.01	<0.01	8	0	8	<0.01	8	<0.01	8	<0.01
Aro >C7-C8	mg/kg			<0.01	<0.01	8	0	8	<0.01	8	<0.01	8	<0.01
Aro >C8-C10	mg/kg	190		4	<1	8	2	6	<1	6	<1	6	<1
Aro >C10-C12	mg/kg	390		4	<1	8	1	7	<1	7	<1	7	<1
Aro >C12-C16	mg/kg	670		14	<1	8	6	2	2	2	2	2	2
Aro >C16-C21	mg/kg	930		45	<1	8	7	1	9	9	9	9	9
Aro >C21-C35	mg/kg	1700		107	5	8	8	0	23	23	23	23	23
Total Aromatics	mg/kg			174	5	8	8	0	34	34	34	34	34
TPH (Ali & Aro)	mg/kg			206	7	8	8	0	37	37	37	37	37
BTEX - Benzene	mg/kg	0.87		<0.01	<0.01	8	0	8	<0.01	8	<0.01	8	<0.01
BTEX - Toluene	mg/kg	680		<0.01	<0.01	8	0	8	<0.01	8	<0.01	8	<0.01
BTEX - Ethyl Benzene	mg/kg	260		<0.01	<0.01	8	0	8	<0.01	8	<0.01	8	<0.01
BTEX - o Xylene	mg/kg	332		<0.01	<0.01	8	0	8	<0.01	8	<0.01	8	<0.01
BTEX - m & p Xylene	mg/kg	310		<0.01	<0.01	8	0	8	<0.01	8	<0.01	8	<0.01
MTBE	mg/kg	210		<0.01	<0.01	8	0	8	<0.01	8	<0.01	8	<0.01
Polycyclic aromatic hydrocarbons													
Acenaphthene	mg/kg	1170		0.17	<0.01	20	9	11	0.03	0.03	0.03	0.03	0.03
Acenaphthylene	mg/kg	970		0.18	<0.01	20	6	14	0.03	0.03	0.03	0.03	0.03
Anthracene	mg/kg	10900		0.84	<0.02	20	9	11	0.11	0.11	0.11	0.11	0.11
Benzo(a)anthracene	mg/kg	13		3.1	<0.04	20	14	6	0.7	0.7	0.7	0.7	0.7
Benzo(a)pyrene	mg/kg	5		2.72	<0.04	20	14	6	0.63	0.63	0.63	0.63	0.63
Benzo(b)fluoranthene	mg/kg	3.7		2.76	<0.05	20	14	6	0.71	0.71	0.71	0.71	0.71

Lab sample ID 20/0617/35_20/0617/36
 Client sample ID WS112 WS112

Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detects	Client sample ID								
									AS1	AS2	AS3	AS4	AS5	HP01	HP02	HP04	HP06
Lab sample ID	20/05956/1	20/05956/2	20/05956/3	20/05956/4	20/05956/5	20/06171/13	20/06171/14	20/06171/16	20/06171/18	20/06171/19							
Client sample ID	AS1	AS2	AS3	AS4	AS5	HP01	HP02	HP04	HP06	HP07							
Depth to top		0	0	0	0	0	0.1	0.05	0.05	0.15	0.05						
Depth to bottom		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.15	0.05						
Date sampled		17/07/20	17/07/20	17/07/20	17/07/20	17/07/20	17/07/20	16/07/20	16/07/20	16/07/20	16/07/20						
		10	10	10	10	20	20	20	20	20	20						
Benzo(ghi)perylene	mg/kg	350		0.98	<0.05	20	20	20	20	20	20	0.16				0.68	
Benzo(k)fluoranthene	mg/kg	100		1.17	<0.07	20	20	20	20	20	20	0.22				0.85	
Chrysene	mg/kg	27		3.12	<0.06	20	20	20	20	20	20	0.65				2.42	
Dibenzo(gh)anthracene	mg/kg	0.3		0.26	<0.04	20	20	20	20	20	20	<0.04				0.18	
Fluoranthene	mg/kg	900		6.87	<0.08	20	20	20	20	20	20	1.12				4.45	
Fluorene	mg/kg	880		0.28	<0.01	20	20	20	20	20	20	0.03				0.16	
Indeno(123-cd)pyrene	mg/kg	41		1.34	<0.03	20	20	20	20	20	20	0.22				0.9	
Naphthalene	mg/kg	71		0.13	<0.03	20	20	20	20	20	20	0.04				0.13	
Phenanthrene	mg/kg	440		4.06	<0.03	20	20	20	20	20	20	0.53				2.6	
Pyrene	mg/kg	2040		5.5	<0.07	20	20	20	20	20	20	0.94				3.58	
Total PAH-16MS	mg/kg			33.5	<0.08	20	20	20	20	20	20	5.66				23	
Other analytes																	
% Stones >10mm	% w/w			23.8	<0.1	37	14	23	14	23	14	<0.1	<0.1	<0.1	6.5	<0.1	
Organic matter	% w/w			17.7		3	12	12	12	12	0						
pH BRE	pH			8.52	5.06	28	28	28	28	28	0			7.5	6.35	5.06	6.67
Sulphate (acid soluble)	mg/kg			7.36	5.38	12	12	12	12	12	0						7.65
Sulphate (water sol 2:1)	g/l			1500	210	8	8	8	8	8	0				670		1500
Sulphate BRE (acid sol)	% w/w			0.09	<0.01	8	8	8	8	8	3			<0.01	<0.01		<0.01
Sulphur BRE (total)	% w/w			0.06	<0.02	12	12	12	12	12	7						
	% w/w			0.03	<0.01	12	12	12	12	12	6						

Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detect	Client sample ID							Depth to top	Depth to bottom		
									HP09	TP01	TP02	TP03	TP04	TP04	TP05			TP06	TP06
									20/01041/1	20/01041/1	20/01041/4	20/01041/5	20/01041/5	20/01041/6	20/01041/7	20/01041/9	20/01041/10	20/01041/11	20/01041/13
									0.05	0.1	0.3	0.3	0.3	0.3	0.3	1	0.1	0.6	1.2
									17/07/20	29/01/20	29/01/20	29/01/20	29/01/20	29/01/20	29/01/20	29/01/20	30/01/20	30/01/20	30/01/20
Benzo(ghi)perylene	mg/kg	350		0.98	<0.05	20	10	10	0.09		<0.05			0.14	<0.05	<0.05			
Benzo(k)fluoranthene	mg/kg	100		1.17	<0.07	20	8	12	<0.07		<0.07			0.15	<0.07	<0.07			
Chrysene	mg/kg	27		3.12	<0.06	20	14	6	0.23		<0.06			0.43	<0.06	<0.06			
Dibenzo(gh)anthracene	mg/kg	0.3		0.26	<0.04	20	3	17	<0.04		<0.04		<0.04	<0.04	<0.04	<0.04			
Fluoranthene	mg/kg	900		6.87	<0.08	20	14	6	0.36		<0.08			0.79	<0.08	<0.08			
Fluorene	mg/kg	880		0.28	<0.01	20	7	13	<0.01		<0.01			0.02	<0.01	<0.01			
Indeno(123-cd)pyrene	mg/kg	41		1.34	<0.03	20	14	6	0.1		<0.03		<0.03	0.18	<0.03	<0.03			
Naphthalene	mg/kg	71		0.13	<0.03	20	4	16	<0.03		<0.03		<0.03	<0.03	<0.03	<0.03			
Phenanthrene	mg/kg	440		4.06	<0.03	20	15	5	0.19		<0.03			0.41	<0.03	<0.03			
Pyrene	mg/kg	2040		5.5	<0.07	20	14	6	0.31		<0.07			0.69	<0.07	<0.07			
Total PAH-16MS	mg/kg			33.5	<0.08	20	14	6	1.91		<0.08			4.02	<0.08	<0.08			
Other analytes																			
% Stones >10mm	% w/w			23.8	<0.1	37	14	23	<0.1		2.2	<0.1		3.1	0.9	11.9	<0.1	<0.1	<0.1
Organic matter	% w/w			17.7		3	12	0	11.5		6.57		3	5.8		9.9			
pH BRE	pH			8.52	5.06	28	28	0	6.28		6.48		6.48	5.51	5.38	6.25			
Sulphate (acid soluble)	mg/kg			7.36	5.38	12	12	0	6.47		6.47		6.48	5.38	5.38	6.98			6.63
Sulphate (water sol 2:1)	g/l			1500	210	8	8	0	690					540		1200			
Sulphate BRE (acid sol)	% w/w			0.09	<0.01	8	3	5	<0.01				<0.01	0.04		0.04			
Sulphur BRE (total)	% w/w			0.06	<0.02	12	7	5	0.05		0.05		0.06	0.03	0.03	<0.02			0.04
	% w/w			0.03	<0.01	12	6	6	0.02		0.02		0.03	<0.01	<0.01	<0.01			0.02

Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-dete	Lab sample ID													
									WS105	WS105	WS107	WS108	WS108	WS108	WS109	WS110	WS110	WS111	WS111			
Benzo(ghi)perylene	mg/kg	350		0.98	<0.05	20	10	<0.05	0	0.7	0	0	0.8	0	0	0.6	<0.05					
Benzo(k)fluoranthene	mg/kg	100		1.17	<0.07	20	8	12	<0.07	0.2	0.1	0.2	0.9	0.2	0.1	0.7	<0.07					
Chrysene	mg/kg	27		3.12	<0.06	20	14	6	0.13													
Dibenzo(gh)anthracene	mg/kg	0.3		0.26	<0.04	20	3	17	<0.04													
Fluoranthene	mg/kg	900		6.87	<0.08	20	14	6	0.18													
Fluorene	mg/kg	880		0.28	<0.01	20	7	13	<0.01													
Indeno(123-cd)pyrene	mg/kg	41		1.34	<0.03	20	14	6	0.04													
Naphthalene	mg/kg	71		0.13	<0.03	20	4	16	<0.03													
Phenanthrene	mg/kg	440		4.06	<0.03	20	15	5	0.1													
Pyrene	mg/kg	2040		5.5	<0.07	20	14	6	0.15													
Total PAH-16MS	mg/kg			33.5	<0.08	20	14	6	0.9													
Other analytes																						
% Stones >10mm	% w/w			23.8	<0.1	37	14	23	9.6	23.8	2.3	<0.1	<0.1	<0.1	5.4	<0.1				9	<0.1	
Organic matter	% w/w			17.7		3	12	0	9.1	17.7	6.31			12.1	6.24	7.32				5.87	6.88	
pH	pH			8.52	5.06	28	28	0	5.68	8.52	8.52			7.32		5.98				250	0.03	
pH BRE	pH			7.36	5.38	12	12	0	5.97													
Sulphate (acid soluble)	mg/kg			1500	210	8	8	0														
Sulphate (water sol 2:1)	g/l			0.09	<0.01	8	3	5														
Sulphate BRE (acid sol)	% w/w			0.06	<0.02	12	7	5	<0.02												0.02	
Sulphur BRE (total)	% w/w			0.03	<0.01	12	6	6	<0.01												0.02	

Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-dete	Lab sample ID 20/06171/35 20/06171/36	
									Client sample ID WS112	WS112
									Depth to top	0
									Depth to bottom	0.1
									Date sampled	17/07/20
										17/07/20
Benzo(ghi)perylene	mg/kg	350		0.98	<0.05	20	10	10	0.19	
Benzo(k)fluoranthene	mg/kg	100		1.17	<0.07	20	8	12	0.29	
Chrysene	mg/kg	27		3.12	<0.06	20	14	6	0.79	
Dibenzo(gh)anthracene	mg/kg	0.3		0.26	<0.04	20	3	17	0.05	
Fluoranthene	mg/kg	900		6.87	<0.08	20	14	6	1.43	
Fluorene	mg/kg	880		0.28	<0.01	20	7	13	0.03	
Indeno(123-cd)pyrene	mg/kg	41		1.34	<0.03	20	14	6	0.26	
Naphthalene	mg/kg	71		0.13	<0.03	20	4	16	0.04	
Phenanthrene	mg/kg	440		4.06	<0.03	20	15	5	0.63	
Pyrene	mg/kg	2040		5.5	<0.07	20	14	6	1.18	
Total PAH-16MS	mg/kg			33.5	<0.08	20	14	6	7.1	
Other analytes										
% Stones >10mm	% w/w			23.8	<0.1	37	14	23	10.3	<0.1
Organic matter	% w/w			17.7		12	12	0		
pH	pH			8.52	5.06	28	28	0	6.36	7.36
pH BRE	pH			7.36	5.38	12	12	0		7.36
Sulphate (acid soluble)	mg/kg			1500	210	8	8	0	210	
Sulphate (water sol 2:1)	g/l			0.09	<0.01	8	3	5	0.09	
Sulphate BRE (acid sol)	% w/w			0.06	<0.02	12	7	5		<0.02
Sulphur BRE (total)	% w/w			0.03	<0.01	12	6	6		<0.01