

**COWM TOP, CASTLETON.**

**Preliminary  
PHASE I & PHASE II  
Contamination and Geotechnical Assessment**

**For: GLP Ltd & Barratt Homes.**

**February 2021**

**R2228-R02-v3**

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Phase II Contamination and Geotechnical  
Assessment

**Client:** GLP Ltd & Barratt Homes

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| Version | Report Status | Date       | Details of Revision                                                            |
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| V1      | Draft         | 21/07/2016 | Draft pending receipt of geotechnical laboratory testing and asbestos analysis |
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| V3      | Final         | 22.02.21   | Updated details for final issue to client.                                     |

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## 1. Introduction

1.1. Smith Grant LLP (SGP) was instructed by GLP Ltd & Barratt Homes to undertake a Stage 1 Geoenvironmental Appraisal of a parcel of land to the north of Trows Lane Farm, Castleton, Rochdale. Following SGP's report on the site in January 2016 (reference R2228-R01-v1), SGP has been further instructed by GLP Ltd & Barratt Homes to undertake a Phase II Ground Investigation and subsequent Contamination and Geotechnical Assessment. Site details are:

**Table 1.1: Site details**

|                                |                                                                          |
|--------------------------------|--------------------------------------------------------------------------|
| <b>Address</b>                 | Land to north of Trows Farm, Trows Lane, Castleton, OL11 2UF             |
| <b>National Grid Reference</b> | 389188, 410262                                                           |
| <b>Local Authority</b>         | Rochdale Borough Council                                                 |
| <b>Site Area</b>               | Approximately 20 Ha                                                      |
| <b>Current Nature of Site</b>  | Open fields use for grazing                                              |
| <b>Site Access</b>             | Off Trows Lane via Trows Farm from south or Cripple Gate Lane from north |
| <b>Proposed use</b>            | Residential development                                                  |

**Figure 1.1: Site Location**



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1.2. This report has been produced to identify potential constraints to redevelopment associated with ground conditions at the site and within the surrounding environs. The report describes the findings of Phase I Ground Contamination Assessment (Desk Study) and following Phase II Ground Investigation carried out by SGP, the ground conditions encountered and discusses their implications with regard to the proposed development based on the findings of the desk study, fieldwork and subsequent laboratory testing. The report methodology follows the



framework described in the EA / DEFRA Contaminated Land Report 11: 'Model Procedures for the Management of Land Contamination 2004', BS 5930:2015 Code of Practice for Ground Investigations.

- 1.3. This report also considers potential constraints to redevelopment resulting from physical ground conditions and stability. The assessment relies on information on ground conditions based on limited preliminary site investigation and laboratory.
- 1.4. The assessment comprises a review of readily available information on the environmental setting, the historical development of the site and surrounding land, along with a subsequent Phase II ground investigation and laboratory testing results. This report contains a qualitative and quantitative risk assessment and where appropriate makes recommendations for further investigations appropriate to the current use and future development.

## 2. Information Sources

2.1. The principle sources of information consulted in the preparation of this report include:

| reference and date                                                                                                                                                                                    | author and source                                  | purpose and information content                                                                                                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Topography, geology, hydrogeology and hydrology</b>                                                                                                                                                |                                                    |                                                                                                                                                                             |
| Explorer Sheet 277: Manchester & Salford<br>2007                                                                                                                                                      | Ordnance Survey<br>(OS), Explorer Map,<br>1:25,000 | general mapping information<br>including topography, ground<br>features, rights of way,<br>communications, water<br>features, etc.                                          |
| <a href="http://mapapps.bgs.ac.uk/geologyofbritain/home.html">http://mapapps.bgs.ac.uk/geologyofbritain/home.html</a><br>2015                                                                         | British Geological<br>Survey (BGS)                 | distribution of geological units<br>at surface and depth and<br>borehole database records                                                                                   |
| <a href="http://mapapps.bgs.ac.uk/geologyofbritain/home.html?mode=boreholes">http://mapapps.bgs.ac.uk/geologyofbritain/home.html?mode=boreholes</a><br>2015                                           | British Geological<br>Survey (BGS)                 | Scanned borehole logs                                                                                                                                                       |
| 77317590_1_1<br>2015                                                                                                                                                                                  | Landmark Information<br>Group                      | Information relevant to ground<br>stability hazards including<br>mining and natural cavities<br>data, historical land use,<br>ground stability data and<br>ground movement  |
| 51001057857001<br>2015                                                                                                                                                                                | The Coal Authority                                 | Information and past and<br>present underground, shallow<br>and open cast mining,<br>locations of mine entries, coal<br>mining subsidence claims,<br>and mine gas emissions |
| <a href="http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&amp;language=e">http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&amp;language=e</a><br>2014 | Environment Agency                                 | Aquifer designations,<br>groundwater Source<br>Protection Zones and details<br>of abstractions                                                                              |
| HPA-RPD-033: Indicative Radon Atlas of England and Wales<br>2007                                                                                                                                      | Health Protection<br>Agency                        | mapping defining radon<br>affected areas in England &<br>Wales                                                                                                              |

| reference and date                                                                                                                                                                                      | author and source          | purpose and information content                                                                                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Historical data</b>                                                                                                                                                                                  |                            |                                                                                                                                                  |
| 77317590_1_1<br>2015                                                                                                                                                                                    | Landmark Information Group | historical mapping at various scales scale from 1849 onwards                                                                                     |
| Aerial/satellite photography<br>2000-2013                                                                                                                                                               | Various sources            | Historical images of site from 2003 & 2006                                                                                                       |
| <a href="http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&amp;language=en">http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&amp;language=en</a><br>2014 | Environment Agency         | Historical landfills                                                                                                                             |
| <b>Environmental Sensitivity</b>                                                                                                                                                                        |                            |                                                                                                                                                  |
| 77317590_1_1<br>2015                                                                                                                                                                                    | Landmark Information Group | Information on Environment Agency and hydrogeological records, waste, hazardous substances, geology, industrial land use and sensitive land uses |
| <a href="http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&amp;language=en">http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&amp;language=en</a><br>2016 | Natural England            | general information on watercourses, groundwater source protection zones and vulnerability, pollution and landfills                              |
| <a href="http://www.magic.gov.uk">www.magic.gov.uk</a><br>2016                                                                                                                                          | DEFRA                      | web-based interactive map containing information on nature conservation areas                                                                    |

## 2.2. Previous Site Investigations and Consultations

2.2.1. SGP has used a sketch plan of the site boundary provide by GLP Ltd & Barratt Homes. for the purposes of defining the site boundary; all referenced features in relation to the site boundary (including those in the attached Envirocheck and Coal Authority search reports) are therefore approximate. Attached drawings are indicative only and should not be scaled or used for design purposes. "Drawing D01- Site Layout and Ground Investigation Locations" shows the site features as shown on the most recent OS mapping available at the time of writing.

2.2.2. SGP is unaware of any site investigations having been undertaken at the site. SGP has not carried out any consultations with the Local Authority, the Animal & Plant Health Agency, Environment Agency or other regulatory bodies.

2.2.3. SGP carried out a brief consultation with the current site owner, who advised that the site had remained farmland throughout its' recent history as far as they were aware, and had not been subject to potentially contaminative land uses or waste disposal.

2.2.4. SGP has requested plans from the relevant utility providers regarding the major energy infrastructure observed on the site. Utility and services plans including water supplies, drainage or communications equipment were received prior to the Phase II intrusive ground investigation.

### 2.3. Site Inspection

2.3.1. A preliminary inspection of the site was carried out by Ben Thomas (Partner) of SGP on the 21<sup>st</sup> December 2015. The inspection was limited to areas visible from viewpoints around the west and north site boundaries.

2.3.2. A second, comprehensive inspection of the site was carried out immediately prior to Phase II site investigation by Ben Thomas (Partner) and C.Salwa (Consultant) of SGP on the 28<sup>th</sup> June 2016. During the investigation SGP were provided with anecdotal evidence from the landowner that two small tips existed in the central northern parts of the site.

### 3. Development History and Current Status

#### 3.1. Historical Uses

3.1.1. A summary of significant historical features, developments, and land uses identified is provided in Table 1 below.

**Table 1: Summary of Relevant Development History**

| Map                             | Site                                                                                                                                                                                                                                                                                                                                                                                                                                           | Surrounds                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1851<br>1:10,560<br>Drawing D02 | <p>The site is divided into several fields and a lane/pathway crosses from a central part of the southern boundary to a building in the north east corner of the site annotated 'Grange Barn'.</p> <p>In the southwest of the site it appears that a building straddles the southern boundary.</p> <p>Lower Trows Lane runs along the inside of the western boundary and Cripple Gate Lane runs along the inside of the northern boundary.</p> | <p>Fields surround the site to the north, west, east and southeast of the site.</p> <p>To the south west of the site 'Trows' and 'Higher Trows' are annotated indicating the presence of a water body. A lane also runs parallel to the western part of the southern border beyond which is the presence of a small collection of buildings approximately 15m from the site boundary.</p> <p>Bordering the centre of the southern boundary is a small collection of buildings and a pond beyond which, 40m from the site, is 'Grange Mill Print Works'.</p>                                                                                                                                                                                                                                                                                                         |
| 1890-93<br>1:2,500              | <p>The building which straddles the southern boundary appears to be part of 'Trows Farm'.</p>                                                                                                                                                                                                                                                                                                                                                  | <p>The buildings mapped previously which lie adjacent to the southern boundary are annotated 'Trows Farm' and 'The Grange' appearing to be either residential properties or farmhouses.</p> <p>'Trows House' is now indicated bordering the southwest of the site.</p> <p>Beyond 'Trows Lane' directly to the south of the site a reservoir is mapped. Further reservoirs and 'Mill pond' lie in close proximity to the centre and eastern parts of the southern boundary, bordering the site in some locations.</p> <p>The buildings 15m to the southwest of the site appear to be part of 'Castleton Print Works' which also appear to incorporate the former 'Grange Mill Print Works'. Within the vicinity of these buildings a tank is annotated 120m to the southwest of the site.</p> <p>An 'Old Gravel Pit' is mapped 40m to the northwest of the site.</p> |
| 1894                            | No significant changes to site.                                                                                                                                                                                                                                                                                                                                                                                                                | No significant changes to site.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| Map                                  | Site                                                                                                                                                                               | Surrounds                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1:10,560                             |                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 1910<br>1:2,500                      | A feature that appears to be a pond is situated near the northern boundary in the centre of the site.                                                                              | <p>The 'Castleton Print Works' are now annotated as 'disused'.</p> <p>The circular feature bordering the south of the site is now labelled as a reservoir.</p> <p>The reservoirs to the south of the site appear to be fed by two streams coming from the east and south east. The reservoirs then appear to discharge westwards via a stream along which, 140m to the southwest of the site, is a building labelled 'Filter Tanks'. The stream then flows towards Rochdale Canal.</p> <p>The 'Old Gravel Pit' to the northwest is now mapped as 'Old Sand Pit' and two other 'Old Sand Pits' are now present between 80 and 160m west of the site boundary.</p> <p>The tank 120m to the southwest of the site is no longer annotated.</p> <p>A tank is indicated 140m to the north east of the site just south of the property 'Top o' th' Hill'.</p> |
| 1910-1911<br>1:10,560<br>Drawing D03 | No significant changes to site.                                                                                                                                                    | No significant changes to surrounds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 1929-1930<br>1:2,500                 | <p>The property previously annotated 'Grange Barn' in the north east corner has been demolished.</p> <p>A small unidentified building is now present in the north west corner.</p> | <p>The 'Filter Tanks' are now labelled as 'Disused'.</p> <p>40m south and 80m southwest of the site, to the east and south of the former 'Castleton Works' building tanks are indicated.</p> <p>To the west of the site two features which appear to be ponds are indicated 100m and 140m from the site boundary.</p> <p>A spring is mapped 140m to the east of the site.</p> <p>A sand pit is annotated 180m south of the site.</p>                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 1931-32<br>1:10,560                  | No significant changes to site.                                                                                                                                                    | No significant changes to surrounds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 1937<br>1:10,560<br>1938<br>1:10,560 | No significant changes to site.                                                                                                                                                    | <p>The buildings 40m south of the site, formerly 'Grange Mill Print Works', are now referred to as 'Trows Upper Works (Engineering)' with an associated chimney.</p> <p>200m to the southwest of the site a large area annotated 'Sand &amp; Gravel Pits' is present.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |



| Map                                                | Site                                                                                                                                                                                                                                                                                                      | Surrounds                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                    |                                                                                                                                                                                                                                                                                                           | <p>A second tank associated with the property 'Top o' th' Hill' is indicated 140m to the north east of the site.</p> <p>Residential development has expanded to the southwest of the site.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 1938<br>1:10,560<br>Drawing D04                    | No significant changes to site.                                                                                                                                                                                                                                                                           | No significant changes to surrounds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 1956<br>1:10,000<br>Drawing D05                    | No significant changes to site.                                                                                                                                                                                                                                                                           | <p>The 'Castleton Works' are no longer annotated as 'disused'.</p> <p>Markings indicative of significant residential development to the northeast are present.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 1956<br>1:2,500                                    | <p>The pond feature to the north of the site appears to have been in-filled.</p> <p>Three springs are now annotated in the eastern part of the site one of which is situated in marshy ground towards the northeast of the site.</p> <p>An electricity pylon is indicated along the western boundary.</p> | <p>The reservoir directly to the southeast of the site appears to have shrunk with increased vegetation indicated in the area.</p> <p>The 'Castleton Works' buildings to the southwest of the site are labelled as 'Trows Die-casting Works' and 'Sheet Metal Works' and incorporates an electric sub-station. The tanks indicated to the east of these buildings in previous maps are now annotated as 'Old Tanks'.</p> <p>The 'Filter Tanks' building is now annotated as 'Engineering Works'.</p> <p>The 'Sand &amp; Gravel Pits' to the southwest of the site have expanded and now includes a reservoir.</p> <p>Tanks are no longer indicated surrounding 'Top o' th' Hill'.</p> <p>A spring is mapped 60m to the east of the site.</p> <p>Significant residential development has occurred to the northeast and northwest of the site.</p> |
| 1965-1968<br>1:10,000                              | No significant changes to site.                                                                                                                                                                                                                                                                           | Residential development has expanded to the northeast of the site.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 1970<br>1:2,500<br>(limited mapping south of site) | No significant changes to site.                                                                                                                                                                                                                                                                           | No significant changes to surrounds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 1975<br>1:1,250                                    | Embankments are present along the eastern boundary which lead to a road adjacent to the                                                                                                                                                                                                                   | A dual carriageway and junction sliproads borders the site to the east, in a cutting.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| Map                                                                         | Site                                                                                                                                                                                                 | Surrounds                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (limited mapping southeast of site)                                         | site.                                                                                                                                                                                                | To the south of the site another motorway with embankments is present running east to west. This road has been built over part of the 'Sand and Gravel Pits' noted to the southwest of the site in previous mapping. Residential development has expanded to the west and southwest of the site.       |
| 1975-1979<br>1:10,000<br>Drawing D06                                        | No significant changes to site.                                                                                                                                                                      | The sand pit annotated 180m south of the site beyond Thornham New Road in previous mapping is now described as 'Active Workings' and is surrounded by a number of ponds.                                                                                                                               |
| 1983-1988<br>1:10,000<br>(limited mapping northwest of site)<br>Drawing D07 | No significant changes to site.                                                                                                                                                                      | The 'Active Workings' to the south are now described as 'Disused Workings'. What remained of the 'Sand and Gravel Pits' to the southwest of the site appears to have been infilled and no development appears to have taken place over this area.                                                      |
| 1992<br>1:1,250                                                             | The building which straddled the southern boundary in previous mapping no longer appears to encroach onto the site however another structure forming part of 'Trows Farm' does appear to be present. | 'Trows Die-casting Works', the 'Sheet Metal Works' and the 'Engineering Works' to the south and southwest of the site are now generically described as 'Works' and 'Upper Works'. Residential development has expanded to the west of the site with properties lying adjacent to the western boundary. |
| 1990-1993<br>1:10,000<br>(limited mapping south and northeast of site)      | No significant changes to site.                                                                                                                                                                      | No significant changes to surrounds.                                                                                                                                                                                                                                                                   |
| 2000<br>Satellite Imagery                                                   | The structure forming part of 'Trows Farm' in the southwest corner of the site no longer appears to be present.                                                                                      | No significant changes to surrounds.                                                                                                                                                                                                                                                                   |
| 2003<br>Satellite Imagery                                                   | No significant changes to site.                                                                                                                                                                      | No significant changes to surrounds.                                                                                                                                                                                                                                                                   |
| 2005<br>Satellite Imagery                                                   | No significant changes to site.                                                                                                                                                                      | No significant changes to surrounds.                                                                                                                                                                                                                                                                   |
| 2006                                                                        | No significant changes to site.                                                                                                                                                                      | No significant changes to surrounds.                                                                                                                                                                                                                                                                   |

| Map                          | Site                            | Surrounds                                                                                                                       |
|------------------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| 1:10,000                     |                                 |                                                                                                                                 |
| 2013<br>Satellite<br>Imagery | No significant changes to site. | Two large unidentified buildings are now present to the north at approximate distances of 120m and 200m from the site boundary. |
| 2015<br>1:10,000             | No significant changes to site. | No significant changes to surrounds.                                                                                            |

3.1.2. Whilst there are some gaps in the historical map coverage it is considered that the available information provides adequate coverage of the development history of the site and its' immediate surroundings.

### 3.2. Current land condition

3.2.1. A summary of existing significant features noted during SGP's inspection and examination of contemporary records is presented below.

**Table 3.2: Present Land Condition**

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Site Description</b> | The site currently comprises open fields, divided by stock fencing. The fields are in use for grazing.                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Access</b>           | Access to the various areas is gained from Trows Farm off Trows Lane                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Boundaries</b>       | <p><b>North:</b> Stock fencing and hedgerows onto a public footpath/track known as Cripple Gate Lane.</p> <p><b>East:</b> Stock fencing onto top of cutting for A627(M) road.</p> <p><b>South:</b> Stock fencing and hedgerows onto Trows Lane or properties/land (Trows House, Trows Farm, The Grange) off Trows Lane.</p> <p><b>West:</b> Stock fencing and hedgerows onto a public footpath to rear of adjacent housing.</p>                                                                       |
| <b>Drainage</b>         | No surface water was observed on the site during the inspection which was carried out in winter during a period of wet weather and during site investigation carried out in June. A number of reservoirs are present to the south of the site over Trows Lane, occupying the base of a valley which appears to form the upper reaches, or a tributary of Trub Brook. A number of springs, and issues are mapped as arising on the site which appear to flow to the south to the ponds and reservoirs. |
| <b>Rights of Way</b>    | SGP did not identify any public right of way crossing the site, although the site is readily assessable from the adjacent public footpaths to the west and north.                                                                                                                                                                                                                                                                                                                                     |
| <b>Structures</b>       | The only above ground structures visible or identifiable from contemporary satellite imagery is a dilapidated small building in the northwest corner of the site. The dwellings and outbuildings of Trows House, Trows Farm and the Grange all appear to lie outside the site boundary provided to SGP.                                                                                                                                                                                               |

|                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Services and Utilities</b> | SGP noted warning signs and marker posts for a high pressure gas main near the western ends of the southern and northern site boundaries: a number of marker posts are also present within the site which appear to link these two locations, indicating the presence of a high pressure gas pipeline crossing the west of the site. The presence of high pressure gas main was confirmed with utility map. Two overhead electricity lines enter the site from the northeast corner and cross the northeast part of the site although the location where they exit the site to the east or south was not confirmed during the site walkover but observed on utility plan. However, the survey does not constitute a comprehensive utility services search and relies on information provided by third parties.                                                                                                                      |
| <b>Industrial Land Use</b>    | There are no contemporary trade directory entries or indications of industrial use within the site itself. A small commercial estate to the southwest appears to be used for various garage/vehicle repair services and car sales and is associated with four trade directory entries which also include a manufacturer and distributor of floor polishing equipment. Although not listed in the trade directory, the larger industrial premises immediately to the south of the southwest corner of the site is signed as a die casting and metal fabrication works; this facility contains a number of bulk above ground storage tanks, workshops and yards and is subject to of Local Authority Air Pollution Controls. Trows House at the southwest corner of the site is a nursery and Trows Farm and the Grange are farm buildings with residential dwellings, vehicle storage areas and various outbuildings of unknown use. |
| <b>Surfaces / Vegetation</b>  | The large fields which make up the majority of the site areas appear to be grassed with hedgerows and trees internally present at the various field boundaries. Some parts of the site appear to be rough scrub or heath. No invasive species were recorded during the site inspections however the survey does not constitute a comprehensive ecological assessment. Two areas without vegetation and a surface comprising loose black gravel of ash, clinker and coke as well as pieces of mica and drilled stone, cement sheeting and glass were noted during the investigation                                                                                                                                                                                                                                                                                                                                                  |

### 3.3. Present land condition

**Table 3.3: Environmental Setting**

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Surrounding Landuse</b> | The site is located immediately west and within 100m (to the north) of two major Roads, the A627(M) and M62 motorways, respectively. In the land between the south of the site and the M62 motorway, a number of buildings, used for farms, dwellings and light industrial use (vehicle repair, manufacturing and metal processing) are present in the base of a valley containing several reservoirs formerly associated with a historical print works. Beyond the motorways is agricultural land, predominantly rough grazing with the residential areas of Balderstone to the northwest. To the north a number of modern warehousing and storage units are present in the Crown Business Park beyond the footpath with further commercial development to the northwest and beyond the residential area of East Castleton which extends to the public footpath bounding the west of the site. |
| <b>Topography</b>          | The site generally slopes down from the highest point at the northeast corner (180m AOD) to the south towards the tributary of Trub Brook and the associated reservoirs in the base of the Valley to the south of Trows Lane (150m AOD). However, the site exhibits significant undulations with a series of internal valleys and spurs changing levels locally by up to 20m in the western areas.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Natural Conditions /<br/>Geology</b> | <p>The site lies within a large area of glacial sands and gravels extending from Rochdale to the North of Oldham and west to Heywood. Locally the deposits are classified as Hummocky Glacial Terrain comprising moraines and mounds deposited by meltwaters and subject to scouring and erosion to form undulating deposits of variable sediments but dominated by sands and gravels. In the southwest parts of the site glacial till, likely to be dominated by more cohesive (clay) sediments may be present as these outcrop along the southern boundary. The nearest available borehole log immediately to the north of the site adjacent to Cripple Gate Lane (BHSD81SE421), indicates sandy clay forms at significant depth of the superficial deposits, whereas the nearest borehole to the west, around 100m away off Vicarage Road (BHSD81SE333) indicates sand, clay and gravel overlying stiff clays.</p> <p>Bedrock geology is mapped as the Pennine Lower Coal Measures comprising mudstone siltstone and sandstone. Two thicker, named sandstone units are mapped as sub cropping beneath the site, both marked as the Lawrence Rock formation.</p> |
| <b>Hydrogeology /<br/>Groundwater</b>   | <p>Soils on the site are of high leaching potential. The underlying superficial deposits are classed as a Secondary A aquifer. These designations reflect the likely presence of permeable strata within the granular sand and gravel deposits mapped on the site. The bedrock underlying the site is classed as a Secondary A Aquifer, of variable permeability. The Coal Measures are probably mainly of low primary permeability, although the thicker sandstone units mapped on the site may contain more mobile groundwater. The site is not within the catchment of a Groundwater Source Protection Zone within an area classed as of Low Groundwater Vulnerability. The nearest recorded ground water abstraction is over 800m from the site.</p>                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Hydrology /<br/>Drainage</b>         | <p>The soils on the site may be seasonally waterlogged; one small area of standing water was observed within a low point in the site and soils around the various springs and issues are likely to be saturated. The site contains two surface watercourses fed by springs or issues, one of which is classed as a Tertiary River. Both of these flow through gully's or valleys in a south-westerly direction across the site exiting through the southern boundary and feeding the ponds, reservoirs and channels in the base of the adjacent valley which form part of a tributary, or the upper reaches of Trub Brook, itself a tributary of the River Irk, and part of the Irwell/Mersey Catchment.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Flood Risk</b>                       | <p>The EA flood risk map shows the site to be at very low risk (less than 1 in 1,000 annually) from river flooding events.</p> <p>The site has not been designated by the EA as being at risk of flooding from reservoirs: the reservoirs and ponds near the site are all downgradient in the base of the valley below the site to the south.</p> <p>The vast majority of the site is designated as having a very low risk of flooding from surface water (less than 1 in 1,000 annually) however there are two narrow channels associated with the spring-fed surface watercourses present running north-northeast to south-southwest where the risk ranges from a low (1 in 1,000 to 1 in 100 annually) to a high (greater than 1 in 30 annually) risk of flooding from surface water. The higher risk category is restricted to the southern ends of the channels adjacent to the site southern boundary.</p>                                                                                                                                                                                                                                                   |

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Radon</b>                            | The radon atlas indicates the site is in an area where <1% of dwellings may be at or above the action level. No radon protection measures are necessary in the construction of new dwellings or residences.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Ecology and Conservation</b>         | The site is in a Nitrate Vulnerable Zone. The site lies within 100m of an area of Adopted Green Belt. No statutory nature conservation sites, such as SSSIs, SPAs etc. have been identified within 250m of the site.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Natural Ground Stability Hazards</b> | <p>The site has been assessed by BGS as being at very low risk or no hazard of collapsible ground, landslide, running sand and shrinking or swelling clay, and with no compressible or dissolution ground hazards.</p> <p>Given the potential variability of the hummocky glacial deposits and the presence of springs and issues on the site, SGP considered there may be some risk of running sands and excavation stability in parts of the site and that the stability of some of the steeper slopes could require assessment where these would lie within or adjacent to any development proposals. It is also possible that cohesive soils may be present at or near the surface near the southern boundary, although these locally have a very low potential for generating shrinking or swelling instability hazards.</p> <p>The site would presumably require significant regrading to provide sensibly level development platforms in any case so the engineering properties of the superficial deposits would require assessment to determine their potential for re-use and the impacts of changes in moisture content and density on ground stability taking into account final development levels.</p>                                                                                                                                                                                                                                                                                  |
| <b>Mining</b>                           | <p>The site is in an area unaffected by historical coal mining activity according the Coal Authority as no worked seams have been identified at depths with the potential to influence the site.</p> <p>A number of sand pits are marked on the historical plans of the area, the nearest of which is 45m to the northwest of the northwest corner of the site, with several others indicated at greater distances in excess of 100 to the west, south west and south.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Excavation and Land filling</b>      | <p>The development history of the site does not indicate that significant extraction of materials or filling has taken place within the site. No Local Authority information on landfills has been identified and the Environment Agency mapping indicates an active inert landfill (Ashfield Valley) around 500m to the north and the nearest historical landfills (Thornhall Old Road &amp; Newhay Farm) being relatively small and at similar distances to the southeast and southwest. Anecdotal two parts of the site were used for unspecified tipping and the presence of ashy materials at the surface in one of these, and a third location supports the conclusion that the site has been subject to at least small scale waste disposal operations in the past.</p> <p>There is evidence of significant earthworks in the surrounding area on the available historical plans; a number of workings, reservoirs and sand pits to the south of the site were backfilled as part of the M62 road construction. A marsh to the northwest may have been infilled to construct the modern industrial estate at the Crown Business Park. The other works to construct the motorways appear to have mainly involved excavations of deep cuttings to the east of the site. In the southeast part of the site, changes in the surface height contours between historical maps which pre-date and post-date the motorway construction may indicate some of the earthworks extended onto the site.</p> |

|                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Industrial Land use and Infrastructure</b> | <p>On-site activities appear to have been restricted to agricultural uses of the land. Infrastructure identified within the site are restricted to the high pressure gas pipeline and overhead electricity lines observed during the site walkover, although other utility services could exist.</p> <p>Off-site to the south a large former print works was present, parts of which are now used for vehicle repair, light manufacturing and metal processing. A large, modern industrial estate has been constructed to the north of the site which appears to be mainly used for warehousing and storage. It appears unlikely that either of these would have impacted the site in any way.</p> <p>Major roads exist to the east and south of the site, although these are not immediately adjacent to the potentially developable areas being separated by a large steep cutting slope and the Trows Lane and the adjacent reservoirs and embankment.</p> |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### 3.4. Development Proposals

3.4.1. The site is being considered for residential development. For the purposes of defining future receptors with the potential to be impacted by land contamination it is assumed that most parts of the site could contain residential properties with private gardens, or amenity land with landscaping, public open space and infrastructure to support any of these uses.

3.4.2. It must therefore be assumed that, in addition to the environmentally sensitive receptors already existing on the site and the surrounds, that development, construction and maintenance workers, and future occupants will be introduced to the site, resulting in the creation of exposure pathways which do not currently exist.

3.4.3. It is also assumed that disturbance of the site necessary to prepare the land for redevelopment could result in the temporary creation of new exposure pathways.

3.4.4. The use of the site for residential purposes necessitates the construction of numerous new buildings, which are assumed to be of low-rise, traditional construction, and supporting infrastructure including roads, drains sewers and utility services. The potential for physical damage to these structures caused by ground movement, or attack of vulnerable materials by aggressive ground conditions is also considered.

## 4. Preliminary Conceptual Model and Risk Assessment

### 4.1. Methodology

4.1.1. Information from the desk study has been used to identify the likely source-pathway-target relationships that may exist at the site during and following the proposed development. Principal factors that may determine potential sources of contaminants at the site, receptor vulnerability and potential pathways have been identified and each assessed in turn to derive a Conceptual Site Model (CSM).

### 4.2. Site Source Risk Assessment

4.2.1. Natural sources of ground contamination appear to be limited, based on the available evidence; the potential for organic soils and peat appears to be limited and the site is an area where less than 1% of residential dwellings can be anticipated to be impacted by radon gas. Natural background levels of specific metals and metalloids are unlikely to approach generic soil criteria for residential land use.

4.2.2. The historical mapping indicates that the site was open fields, and no indications of previous industrial activity, (including Coal Mining) have been identified within the site. There is a low potential for contamination as a result of agricultural activities and these are usually limited to spills or leaks of relatively transient chemicals such as fertiliser, pesticides, small volumes of fuel and oil assuming the site has not been subject to uncontrolled waste disposal activities.

4.2.3. Several buildings have been identified in the historical mapping and satellite imagery around the perimeter of the site, although given the resolution of the available mapping and the boundary location provided to SGP, most of these could have been on the boundary or just outside the site. Some of these buildings were removed before the use of asbestos in structures became widespread however some remained during this time, including the building still present in the northwest corner. It is possible that asbestos residues could be present locally within the remaining building or around the demolished former structures, however volumes are likely to be minimal.

4.2.4. A pond towards the north of the site appears to have been in-filled around 60 years ago. This could contain waste materials, although readily degradable materials would be expected to have largely broken down in the intervening period. At least three areas of tipped wastes have been identified, these may contain materials with a high organic content, specifically unburnt or partially combusted coal or coke, however these are unlikely to degrade and generate ground gas. There is also a minor possibility that polluting substances in liquid wastes deposited in drums or discharged directly has taken place. There is always a small possibility of animal burial on former agricultural sites.



4.2.5. Apart from the locations of the former pond and buildings and the areas indicated to SGP during the site walkover, it would be difficult to identify any minor random waste deposits using discreet investigation entries. Given the size of the site any of the sources considered above, if present, would be likely to be of limited significance.

#### 4.3. Off-Site Sources

4.3.1. Several areas of infilled land in the immediate surrounds may similarly contain degradable materials with the potential to produce hazardous gas, although it is noted that most of these areas have been developed, mainly for residential use. The nearest such potential source deposits are approximately 50m from the northwest corner of the site, and in excess of 100m, to the other side of a valley to the south, southeast and southwest.

4.3.2. Bulk Storage tanks of unknown content are present in the metal works/die-casting works within the former print works buildings close to the west end of the southern parts of the site of the site. The facility also has a number of Local Authority Air Pollution Controls in place suggesting that emissions may take place.

4.3.3. Minor volumes of fuels, hydrocarbons and other potentially mobile contaminants may be associated with the light industry and vehicle repair further up the valley to the south of the eastern parts of the south boundary.

4.3.4. The other identified local industrial land uses generally have a limited potential to cause significant ground contamination, particularly of mobile pollutants with the potential to migrate towards the site.

4.3.5. Although not related to land quality, it is noted that the entire site falls within an Air Quality Management Area (AQMA) designated by the local authority due to the probability of local air quality failing one or more national air quality objectives (see [http://www.gmtu.gov.uk/gam\\_maps/](http://www.gmtu.gov.uk/gam_maps/)). This is due to the proximity of major highways and the effects of vehicle exhaust emissions. It is likely that an air quality assessment will be required in support of any planning application for the site.

#### 4.4. Potential Receptors

4.4.1. The site is in an area of medium/low environmental sensitivity as far as groundwater is concerned; the underlying bedrock supports a Secondary A Aquifer which may be locally extracted but no nearby abstractions for groundwater supply have been identified. The aquifer and the overlying superficial deposits, probably readily allow infiltration and migration, and therefore probably generate sufficient flows to feed springs on the site which give rise to two small watercourses and also probably support matrix base flow to the watercourse to the south. The surface watercourses are also likely to receive surface water run-off or field drainage and

are therefore sensitive to potential site sources of pollution, if present.

4.4.2. The surrounding area consists of residential land use to the west, and also to the east although this area is separated from the site by a major road. A small number of dwellings, a nursery and small number of dwellings is present off the site's southern boundary and public rights of way bound the west and north boundary, although there is no evidence that public access to the site takes place.

4.4.3. A number of commercial properties exist nearby including a number of commercial properties to the south and a larger industrial estate primarily used for storage and warehousing to the north.

4.4.4. Apart from farm workers and the potential for some occupation of the various enclosures and buildings in the south of the site, there is probably minimal potential for exposure of people to soils on the site under existing conditions, however redevelopment of the site will introduce new receptors, comprising a construction workforce, maintenance workers, visitors and residents, the latter being the most sensitive due to the presence of children resident on the site for long periods of time.

4.4.5. The principal vulnerable receptors for the existing and proposed uses will be:

- the surface watercourses on the site and the larger watercourse/reservoirs to the south;
- construction workers who may be exposed to any contaminants during preparatory and construction works, via direct contact and dust ingestion/inhalation;
- future site users and building occupants, primarily assumed to be residents including infants and children; exposure routes may through ingestion of soil and soil-derived dust, direct skin contact, inhalation of any ground gases / vapours, and uptake of soil contaminants to garden vegetables with subsequent consumption; and,
- future maintenance workers via direct contact

#### 4.5. Controlled Waters Risk Assessment

4.5.1. Mobile groundwater is likely to be present within the underlying natural superficial deposits, and appears to emerge locally at springs and seeps within and adjacent to the site. Groundwater flows within the underlying Coal Deposits are likely to be minimal and are considered to be of low sensitivity.

4.5.2. Flow to the watercourses is probably via surface runoff or preferential flow paths such as drains, however sufficient shallow groundwater flow exists to feed permanent springs and probably also provides base flow to the larger watercourse to the south. Where such pathways exist these could form routes for direct migration of pollutants released from discrete sources (such as spills and leaks of fuel from storage facilities, or releases of other chemicals such as fertilisers or pesticides), however the potential for significant storage facilities within the site itself (which

excludes most of the farm buildings and yards off Trows Lane) is considered low and risks are consequently also assessed as low.

#### 4.6. Human Health Risk Assessment

4.6.1. A development layout has not been produced for the site; for the purposes of human health risk assessment it is assumed that most parts of the site are intended to contain dwellings or areas of publicly accessible land.

4.6.2. The potential for significant contamination to be present that may pose an acute risk to construction workers during the development is low. Similarly, future maintenance workers are unlikely to be exposed to materials with the potential to cause short-term impacts.

4.6.3. Asbestos containing materials could be present in the fabric of the single remaining building and reported tipping areas localised to the north of the site and if so could include damaged and therefore friable materials. Any loose fibrous asbestos on the site could pose a health risk to site workers if disturbed and not properly managed; furthermore, the potential from off-site migration via windblown dust exists from such materials. If the historical buildings present on or near the site boundary contained such materials and were demolished in an uncontrolled manner asbestos residues could be present in shallow soils. There is a general requirement to reduce asbestos exposure to as low as is reasonably practicable and the presence of any detectable concentrations of asbestos is not generally tolerated in shallow soils in a residential setting, in the absence of robust and defensible risk assessment techniques/criteria.

4.6.4. Ash and clinker deposits could contain elevated metals, metalloids and polycyclic aromatic hydrocarbons. Such sources would only normally be considered unacceptable if present at shallow depth in garden areas.

4.6.5. Should any elevated contamination caused through fuel spillages / leakages or storage drums, other discharges of other liquids including pesticides have occurred there could be a potential risk of exposure through direct contact, inhalation and ingestion site users. Again, these are likely to be dominated by long term exposure of residents, particularly children.

4.6.6. Gas generation rates within the natural soils are probably very low; and there is no evidence of significant thicknesses of uncharacterised made ground, although this should be confirmed by site investigation, particularly in the former pond location. Risks associated with other ground gasses are likely to be low; however, the presence of deep fills associated with a former sand pit in close proximity to the site to the northwest may require gas monitoring adjacent to this location.

4.6.7. Other potential areas of deep made ground at further distances to the west, southwest, south and southeast, have been identified. Whilst under certain circumstances these can pose a high

risk of generating significant flows of ground gas with the potential to cause fire, explosion, asphyxia or poisoning, the time since the infilling has taken place, the presence of closer residential dwellings or intervening barriers such as cohesive soils and a watercourse means migration onto the site is considered unlikely.

4.6.8. Similarly, off-site sources of pollutants within the farms immediately to the south and the historical and contemporary commercial and industrial sites to the south beyond Trows Lane could be mobile within the environment however these are down (hydraulic) gradient from the site and migration is likely to be to the south or to the southwest/west, away from the site and impacts are not considered likely. Air pollution from the nearby major roads and possibly the adjacent metal works could influence the site.

#### 4.7. Site Conceptual Model

4.7.1. Potential pollution linkages between the identified contamination sources and existing and future receptors are summarised in Table 4.1 below:

**Table 4.1: Conceptual Site Model**

| Hazardous Source                                                                             |                                                                                                                                                       | Receptor                                                                                            | Pathway                                                                                                                | Risk Assessment |             |            | Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|-----------------|-------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Origin                                                                                       | Contaminant                                                                                                                                           |                                                                                                     |                                                                                                                        | Consequence     | Probability | Risk       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Hazardous substances present as discrete deposits as a result of uncontrolled waste disposal | metals, PAHs, fuels, oils, organic pesticides and asbestos present as discrete deposits within made ground as a result of uncontrolled waste disposal | current / future site users including residents, construction workers / future maintenance workers  | direct contact / dust & soil ingestion and inhalation                                                                  | severe          | unlikely    | <b>low</b> | Solid or adsorbed contaminants may be locally present; relatively low concentrations could be unacceptable within residential garden soils. The potential for more significant sources is difficult to quantify, risks are likely to be dominated by long term exposure of future residents rather than transient and short term exposure of construction or maintenance workers <b>confirm absence through investigation in former pond and building areas and/or watching brief during development but readily mitigated under most reasonably anticipated circumstances through provision of clean soils in areas of soft landscaping and gardens</b> |
|                                                                                              |                                                                                                                                                       | Controlled water receptors, mainly the watercourse to the south and its tributaries within the site | leaching and infiltration through unsaturated zone, enrichment of groundwater and discharge into the site watercourses | medium          | unlikely    | <b>low</b> | Most readily anticipated sources are of low solubility and mobility in the sub-surface environment, here is a low probability that more polluting materials such as tipped drums or tanks may be present <b>confirm through monitoring of receptors and/or intermediate pathways; but readily mitigated through source removal if encountered</b>                                                                                                                                                                                                                                                                                                        |
| Hazardous ground gas from sources within made ground or similar off-site sources             | Methane, carbon dioxide, carbon monoxide and depressed oxygen conditions                                                                              | Site workers: construction stage or future maintenance workers                                      | inhalation risk                                                                                                        | severe          | unlikely    | <b>low</b> | The potential for sources within discrete areas of made ground and fill both externally and internally to the site is recognised but is considered low. <b>Further assessment of risks from ground gas is only likely to be required in the northwest corner or if organic soils/wastes are encountered in investigations in the former pond or other areas during preparatory earthworks; but readily mitigated under most reasonably anticipated circumstances through provision of basic gas protection measures</b>                                                                                                                                  |
|                                                                                              |                                                                                                                                                       | future site users / unventilated voids in future buildings                                          | inhalation risk                                                                                                        | severe          | unlikely    | <b>low</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                              |                                                                                                                                                       | Buildings and structures                                                                            | Accumulation to explosive concentrations                                                                               | severe          | unlikely    | <b>low</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

Note: Risk Assessment based on guidance provided in CIRIA 552, 2001, 'Contaminated Land Risk Assessment: Guide to Good Practice'

#### 4.8. Property Risk Assessment

- 4.8.1. The underlying natural strata are classed by the BGS as being at very low or no risk of collapsible ground, landslide, running sand and shrinking or swelling clay, compressible or dissolution ground hazards. It is noted, however that the local superficial deposits are characteristically variable and the likely presence of a shallow water table in lower-lying areas (as indicated by the presence of several springs) could locally contain soft ground where hollows have been filled with soft sediment or plant materials / peat, and possible instability in steep slopes via spring-sapping. Glacial sands can be loose in nature and subject to immediate settlement when loaded, whereas any pockets of soft silts, clays or peats may be subject to longer-term consolidation. However, in general it is considered that the superficial deposits are likely to be competent and amenable to traditional construction techniques if undisturbed.
- 4.8.2. The site does not appear to have has been subject to significant land-raising or infilling; there is one recorded pond on the site which has been backfilled and other low areas may have been infilled. These activities are unlikely to have been carried out in a controlled manner and therefore any fills present must be assumed to contain variously oversized materials, voids and possibly otherwise deleterious or degradable materials. These are likely to be highly localised, and in the context and scale of any redevelopment of the whole site, readily addressed during preparatory earthworks.
- 4.8.3. Such potential conditions, and the existing topography raise uncertainty as to the likely appropriate foundation solution and infrastructure design for particular areas; furthermore, the land on the site undulates substantially and is likely to require significant regrading. An assessment of the above risks must take into account the cut/fill profiles of proposed preparatory earthworks and proven ground conditions rather than placing reliance on mapped deposits and existing topography.
- 4.8.4. The existing spring fed watercourses, drains and other utilities, in particular the high pressure gas main and overhead electricity cables present on the site will form constraints to building and infrastructure layout.
- 4.8.5. There is a significant risk of surface water flooding in localised, low-lying areas around the existing watercourses in the south of the site.
- 4.8.6. Aggressive ground conditions for concrete are considered unlikely to be present but should be assessed through site investigation. It is unlikely that any hydrocarbon or other organic contamination is present which could constrain the use of certain polymers or require protected water mains.

## 5. Investigation Methodology

### 5.1. General

5.1.1. A total of 21 machine excavated trial pits were formed at the site between the 28<sup>th</sup> and 30<sup>th</sup> June 2016. The logs are provided in Appendix A. National Grid representative marked out the route of the high pressure gas pipeline on the site and advised on the appropriate stand-off distance and crossing procedures, apart from this the locations of the entries were not significantly constrained.

### 5.2. Sampling Strategy

5.2.1. The positions of the exploratory holes were selected by SGP to provide a wide coverage of information on the site area. In general, exploratory holes were positioned to create a semi regular pattern across the site, in order to provide even coverage in all available areas of the site (except within proximity to the high pressure gas main).

5.2.2. As the desk study and site inspection had identified two potential tips at the northern part of the site three of the exploratory holes were targeted on these sources. These included TP06, TP07 and TP08. Some of the exploratory holes were positioned to target low-lying areas to assess thickness of potential soft soils.

5.2.3. Intrusive investigations have therefore been undertaken to:

- confirm the ground conditions underlying the site;
- determine the presence, extent and nature of made ground and soil contamination;
- obtain information if possible on the presence and depth of groundwater;
- obtain preliminary geotechnical information for relevant to the intended development.

### 5.3. Methodology

5.3.1. The trial pits, TP01 to TP21 were excavated with a Yanmar 8T tracked midi excavator to a maximum depth of 3.4m below ground level. The position of all exploratory holes undertaken at the site as part of this investigation can be seen on the Exploratory Hole Location Plans in Drawing 01.

5.3.2. Ten environmental jar samples of shallow Topsoil and Made Ground, and eleven small-disturbed samples of natural soils for chemical testing, and nine bulk samples for geotechnical testing were taken at regular intervals down to the base of the entries for subsequent laboratory testing and inspection.

5.3.3. Two groundwater samples were collected from two springs present on site and one sample was taken from water supply immediately southwest of the site which is spring fed. The position of sampled spring and water supply can be seen on the Exploratory Hole Location Plans in Drawing 01. The purpose of targeting the groundwater at the springs was that these probably

represent the main discharges for groundwater flows through, or arising on, the site and detection of pollutants in these locations would provide a good indicator that a viable source exists on the site. Conversely if the springs are clean then a viable contaminant linkage with the potential to cause pollution at other receptors probably does not exist.

5.3.4. Sample collection was designed to:

- include samples from the upper layers of Topsoil and Made Ground of the ground profile, for human health assessment purposes;
- include samples from underlying natural ground for geotechnical assessment;
- include any soils having contamination indicators; and
- include water samples from local springs and a water supply for chemical assessment.

5.3.5. The investigation was undertaken in accordance with appropriate guidance (BS5930, BS1377, BS10175 and CLR11). On completion, all trial pits were carefully backfilled with arisings in thin layers, ensuring that excavated material was replaced in the same order as it had been removed.

5.3.6. Engineering and Geoenvironmental conclusions given in this report are based on data obtained from these sources but it should be noted that variations, which affect these conclusions, may occur between and beyond the test locations. Also water levels may vary with time.

5.4. Chemical Analysis

5.4.1. Chemical analysis of soils and waters was carried out by Jones Environmental Laboratories, Deeside, working where possible to MCERTS and / or ISO 17025 accreditation. Soil and water samples were stored in appropriate containers as advised by the laboratory, placed in a chilled cool box, and delivered to the laboratory within 48 hours. Chain of custody documentation was completed and is retained by SGP.

5.4.2. Representative soil samples were taken from the following horizons and submitted for a standard suite (pH, soil organic matter (SOM), pH, metals / metalloids & PAHs), asbestos screen, hydrocarbons (TPHCWG), and/or pH and total sulphate.

**Table 5.1: Summary of Soil Chemical Analysis**

| Strata  | Description                                                     | Sample ref | Depth (m bgl) | Analytical suite |
|---------|-----------------------------------------------------------------|------------|---------------|------------------|
| Topsoil | Blackish dark grey slightly clayey sandy TOPSOIL with rootlets. | TP01 J1    | 0.20          | Main Suite*      |
|         |                                                                 | TP06 J1    | 0.10          | Main Suite*      |
|         |                                                                 | TP07 J1    | 0.10          | Main Suite*      |
|         |                                                                 | TP11 J1    | 0.10          | Main Suite*      |
|         |                                                                 | TP17 J     | 0.10          | Main Suite*      |
|         |                                                                 | TP18 J1    | 0.10          | Main Suite*      |



| Strata                   | Description                                                                            | Sample ref | Depth (m bgl) | Analytical suite |
|--------------------------|----------------------------------------------------------------------------------------|------------|---------------|------------------|
| Made Ground              | Black sandy gravel of slag, clinker and brick with ash.                                | TP03 J1    | 0.30          | Main Suite*      |
|                          | Sand with rags, brick and wood.                                                        | TP08 J1    | 0.20          | Main Suite*      |
|                          | Slag, brick, glass, nails, iron frames and rags                                        | TP08 D     | 0.70          | Sulphate and pH  |
|                          | Greyish brown slightly sandy gravelly clay. Gravel is brick.                           | TP13 J1    | 0.30          | Main Suite*      |
|                          | Blackish dark brown slightly gravelly clay. Gravel is brick, ceramic and decayed wood. | TP15 J1    | 0.30          | Main Suite*      |
| Clay (possible fill)     | Very soft grey slightly gravelly CLAY.                                                 | TP13 D     | 3.00          | Sulphate and pH  |
| Alluvium                 | Very soft light grey slightly gravelly CLAY.                                           | TP03 D     | 1.30          | Sulphate and pH  |
|                          |                                                                                        | TP05 D     | 0.60          | Sulphate and pH  |
| Natural Hummocky Deposit | Slightly clayey slightly gravelly SAND                                                 | TP07 D     | 0.60          | Sulphate and pH  |
|                          | Slightly gravelly SAND                                                                 | TP11 D     | 1.60          | Sulphate and pH  |
|                          | Sandy CLAY                                                                             | TP12 D     | 0.90          | Sulphate and pH  |
|                          | Slightly clayey gravelly SAND                                                          | TP15 D     | 1.30          | Sulphate and pH  |
|                          | SAND                                                                                   | TP17 D     | 1.10          | Sulphate and pH  |
|                          | Gravelly SAND                                                                          | TP20 D     | 1.00          | Sulphate and pH  |
|                          | Slightly gravelly SAND                                                                 | TP21 D     | 1.50          | Sulphate and pH  |

\* Main analytical suite comprising of Metals (9), PAHs, asbestos, TPHCWG, MTBE, CrVI, organic matter and pH

5.4.3. Three water samples were submitted for chemical analysis for metals, extractable petroleum hydrocarbons (EPH), sulphates, pH and a comprehensive suite of volatile and semi-volatile organic compounds (VOCs & SVOCs) which represent many common industrial pollutants. The results of the laboratory testing are included within Appendix E.

## 5.5. Geotechnical Laboratory Testing.

5.5.1. Geotechnical analysis of selected soil samples was carried out by Testconsult Ltd laboratory, Warrington. Tests were performed in accord to British Standards BS 1377: Part 2: 1990.

5.5.2. Representative soil samples were taken from granular and cohesive horizons of Hummocky Glacial Deposits and submitted for a standard classification tests i.e. Atterberg Limits and Particle Size Distribution Tests, as well as moisture content.

**Table 5.2: Summary of Soil Geotechnical Testing**

| Strata                      | Description                           | Sample ref | Depth (m bgl) | Testing                                |
|-----------------------------|---------------------------------------|------------|---------------|----------------------------------------|
| Cohesive strata of Hummocky | Slightly gravelly slightly sandy CLAY | TP06 B     | 1.1           | Atterberg Limits and Moisture Content. |
|                             | SAND with lenses of clay              | TP16 B     | 1.0           |                                        |

| Strata                               | Description                                                                                                                                                                                         | Sample ref                                               | Depth (m bgl)                          | Testing                       |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------|-------------------------------|
| Deposits                             | CLAY.                                                                                                                                                                                               | TP18 B                                                   | 2.5                                    |                               |
| Granular strata of Hummocky Deposits | Very clayey SAND with occasional gravel<br>Gravelly clayey SAND<br>Gravelly clayey SAND<br>Clayey SAND with occasional gravel<br>Slightly gravelly sandy CLAY<br>Slightly clayey very gravelly SAND | TP04 B<br>TP09 B<br>TP10 B<br>TP14 B<br>TP18 B<br>TP19 B | 0.8<br>0.9<br>1.3<br>1.5<br>1.0<br>1.4 | Particle Size<br>Distribution |

## 6. Investigation Observations

### 6.1. Ground conditions

6.1.1. The site and laboratory test work revealed that the general succession of strata can be represented by sand and gravel, and locally clay of the Hummocky Glacial Deposits overlain by Topsoil or locally Made Ground, and Alluvium deposits in some of the low-lying areas. It may be summarised as follows:

6.1.2. Topsoil – encountered at 16 of the 21 test locations from ground level down to depths of between 0.25m and 0.7m, with a typically observed thickness of 0.4m. Represented in general by blackish dark grey clayey or sandy loam, locally slightly gravelly, with rootlets. Tree roots were observed in TP04 and TP18.

6.1.3. Made Ground - encountered at 5 of the 21 test locations from ground level down to depths of between 0.7m and 2.2m. Represented by a washed material of gravel of slag, clinker and brick with ash overlying thin alluvium deposit in TP03, waste material in TP08 comprising gravel of slag and brick with rags, wood, bottles, glass, nails, iron frames and shoes. In holes TP13, TP14 and TP15 Made Ground comprises variable mix slightly sandy gravelly clay or topsoil, gravel is angular sandstone, brick and ceramic with decayed wood in TP15.

6.1.4. Alluvium encountered within low-lying areas at TP03 and TP05 from between 0.4m and 1.1m depth down to depths of between 1.5m 1.2m. The thickness is of 0.4m in TP03 and of 0.8m in TP05. Represented by very soft slightly gravelly, locally slightly sandy clay.

6.1.5. Possible fill; very soft clay – very soft slightly gravelly clay overlain by Made Ground was encountered in TP08 and TP13, from 2.2m down to the base of the trial pit TP08 at 3.1m and from 1.8m down to the base of TP13 at 3.4m. Considering the proximity of the A627(M) motorway this deposit could be related to the motorway earthworks.

6.1.6. Hummocky Glacial Deposits – encountered at 19 of the 21 test locations test from between 0.25m and 1.5m down to the base of the trial pits. Represented in general by characteristically variable materials; from clay to occasional boulders but in most of the trial pits observed as slightly laminated, locally slightly cemented fine sand, locally slightly gravelly to gravelly sand, occasionally slightly clayey or containing lenses of clay. Locally were encountered firm to stiff slightly gravelly slightly sandy clay, sandy clay or sandy gravel and gravel with boulders.

6.1.7. Because of intrinsic features of hummocky deposits, the site is characterised by uneven topography comprising some small rounded hills, locally relatively steep slopes and some low-lying areas. The latter frequently contain bogs or minor/seasonal watercourses and morphologically from small valleys. The land near the central and southern parts of the eastern boundary is less hummocky forming a broad slope to the south.

## 6.2. Groundwater

6.2.1. Groundwater was encountered as seepages or inflows in 5 of the 21 exploratory holes, typically in low-lying areas, during the fieldwork, mainly as seepages and inflows within the sandy layers of Hummocky Glacial Deposits and in alluvium layer in TP05.

6.2.2. The groundwater levels are summarised below:

**Table 6.1: Summary of groundwater levels.**

| Exploratory hole | GW level (m bgl) | Type                                             | Material        | Total depth (m) | Approximate hole ground elevation (m) |
|------------------|------------------|--------------------------------------------------|-----------------|-----------------|---------------------------------------|
| TP03             | 1.8              | Inflow                                           | Sand (Hummocky) | 3.0             | ~155                                  |
| TP05             | 0.6              | Inflow                                           | Made Ground     | 2.6             | ~158                                  |
|                  | 1.3              | Inflow                                           | Alluvium        |                 |                                       |
|                  | 2.4              | Standing level after 10min                       | Sand (Hummocky) |                 |                                       |
| TP09             | 2.7              | Seepage                                          | Sand (Hummocky) | 2.7             | ~152                                  |
| TP10             | 2.0              | Seepage                                          | Sand (Hummocky) | 2.0             | ~167                                  |
| TP16             | 0.8              | Seepage                                          | Sand (Hummocky) | 3.0             | ~166                                  |
|                  | 1.3              | Seepage                                          | Sand (Hummocky) |                 |                                       |
|                  | 1.8              | Seepage                                          | Sand (Hummocky) |                 |                                       |
| Spring 1         | -                | spring                                           | Sand (Hummocky) | -               | ~155                                  |
| Spring 2         | -                | spring                                           | Sand (Hummocky) | -               | ~164                                  |
| Water supply     | -                | Supply draining groundwater from Sand (Hummocky) | Sand (Hummocky) | -               | ~155                                  |

## 6.3. Soil Contamination Indicators

6.3.1. Made ground was encountered in during the fieldwork in exploratory holes TP03, TP08, TP13, TP14 and TP15. The depths and type of Made Ground are summarised in the table below:

**Table 6.2: Depths and type of Made Ground.**

| Hole ID | Made Ground depth | Description                                                                                                                                                             |
|---------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TP03    | 1.1               | <b>Washed material</b> of gravel of slag, clinker, brick with ash.                                                                                                      |
| TP08    | 2.2               | <b>Waste material</b> ; gravel of brick, with rags, wood down to 0.6m. From 0.6 down to 2.2m gravel of slag, brick, glass, bottles, iron frames, nails, shoes and rags. |

## 7. Investigation Results

### 7.1. Results of Geotechnical Laboratory test results.

7.1.1. Classification tests on selected samples of cohesive layers of Hummocky Glacial Deposits revealed moisture contents of 16%, 23% and 35% and the modified plasticity index  $I_p$  of 11, 19 and 27, with the fines fraction classified as a soil of low and medium volume change potential. See NHBC Building Standards, Chapter 4.2.

7.1.2. Particle Size Distribution tests on samples of granular layers of Hummocky Glacial Deposits revealed soil fraction of fines between 4.8% and 39%.

7.1.3. The clayey layers were classified as CL – low plasticity clay and CH – high plasticity clay.

### 7.2. Results of Soil Chemical Analysis

7.2.1. The complete soil analytical data are presented in Appendix E. The results of the soil analyses are compared to human health critical values (CVs) for initial screening purposes. The CVs adopted are appropriate to the environmental setting and proposed future residential use of the site, and are taken primarily from the LQM / CIEH Suitable for Use Levels (S4ULs) which are used to define land that is 'not contaminated'. These are derived for a sandy loam soil; reference is initially made to the S4ULs derived for a soil with 1% organic matter as a conservative assumption for screening purposes.

7.2.2. The Defra Category 4 Screening Level (C4SL) for lead in soils under residential land-use has been utilised to allow an initial screening for risk to human health. This is intended to demonstrate that land is definitely not Contaminated Land as defined under Part IIA of the Environmental Protection Act. The adoption of the C4SL in a planning scenario has not been universally accepted, however in the absence of other generic screening criteria for lead following the withdrawal of the SGV by the EA it is considered appropriate to utilise the screening criterion.

7.2.3. Where published human health critical values are unavailable or inappropriate (because the substance does not significantly affect human health but might have an effect on other receptors), then other commonly-used screening values are used, as noted below.

7.2.4. Given the high sensitivity of the planned residential development, the presence of any detectable asbestos in shallow soils is unlikely to be acceptable so the limit of detection has been adopted as a screening value.

7.2.5. All sampled material has been assessed from within the upper 600mm relevant to human health and analysed for a comprehensive analysis suite. It is not known what the development plans for the site entail with regard to a possible material strip from the site, therefore all the sampled

material has been assumed to be relevant to the human health assessment.

7.2.6. Results are summarised below:

**Table 7.1: Summary of Soils Analysis**

| Contaminant           | Number of Samples | Range of Concentrations (mg/kg or indicated) | Soil standard adopted and concentration (residential) (mg/kg or indicated) | Exceedances          |
|-----------------------|-------------------|----------------------------------------------|----------------------------------------------------------------------------|----------------------|
| pH                    | 21                | 4.91-8                                       | -                                                                          | -                    |
| arsenic               | 10                | 5.1-98.9                                     | LQM/CIEH S4UL 37                                                           | TP08 0.2m            |
| cadmium               | 10                | <0.1-5.3                                     | LQM/CIEH S4UL 11                                                           | None                 |
| chromium III          | 10                | 53.9-529.4                                   | LQM/CIEH S4UL 910                                                          | None                 |
| chromium VI           | 10                | <0.3                                         | LQM/CIEH S4UL 6                                                            | None                 |
| copper                | 10                | 17-1011                                      | LQM/CIEH S4UL 2400                                                         | None                 |
|                       |                   |                                              | DEFRA (MAFF) Plant 200                                                     | TP03 0.3m, TP08 0.2m |
| lead                  | 10                | 21-887                                       | C4SL 200                                                                   | TP03 0.3m, TP08 0.2m |
| mercury               | 10                | <0.1-0.5                                     | LQM/CIEH S4UL 40 (inorganic Hg used)                                       | None                 |
| nickel                | 10                | 16.1-168.1                                   | LQM/CIEH S4UL 130                                                          | TP08 0.2m            |
| Se                    | 10                | <1-3                                         | LQM/CIEH S4UL 250                                                          | None                 |
| zinc                  | 10                | 46-872                                       | LQM/CIEH S4UL 3700                                                         | None                 |
|                       |                   |                                              | DEFRA (MAFF) Plant 300                                                     | TP02 0.2m, TP08 0.2m |
| Soil Organic Matter % | 10                | 1.4-34.6                                     | EA inert waste limit 6%                                                    | None                 |
| asbestos screen       | 10                | NAD                                          | Fibres present                                                             | None                 |
| naphthalene           | 10                | 0.04-0.2                                     | LQM/CIEH S4UL 2.3                                                          | None                 |
| benzo(a)pyrene        | 10                | 0.04-0.46                                    | LQM/CIEH S4UL 2.2                                                          | None                 |
| dibenzo(ah)anthracene | 10                | 0.04-0.2                                     | LQM/CIEH S4UL 0.24                                                         | None                 |
| benzo(b)fluoranthene  | 10                | <0.05-0.77                                   | LQM/CIEH S4UL 2.6                                                          | None                 |
| MTBE                  | 9                 | <0.005                                       | None                                                                       | None                 |
| benzene               | 9                 | <0.005                                       | LQM/CIEH S4UL 0.087                                                        | None                 |
| toluene               | 9                 | <0.005                                       | LQM/CIEH S4UL 130                                                          | None                 |
| m/p-xylene            | 9                 | <0.005                                       | LQM/CIEH S4UL 56 (most stringent 'p' used)                                 | None                 |
| o-xylene              | 9                 | <0.005                                       | LQM/CIEH S4UL 60                                                           | None                 |
| aliphatic C5-C6       | 10                | <0.1                                         | LQM/CIEH S4UL 42                                                           | None                 |
| aliphatic C6-C8       | 10                | <0.1                                         | LQM/CIEH S4UL 100                                                          | None                 |
| aliphatic C8-C10      | 10                | <0.1                                         | LQM/CIEH S4UL 27                                                           | None                 |
| aliphatic C10-C12     | 10                | <0.2                                         | LQM/CIEH S4UL 130 (48 vap) <sup>1</sup>                                    | None                 |
| aliphatic C12-C16     | 10                | <4                                           | LQM/CIEH S4UL 1100 (24 sol) <sup>1</sup>                                   | None                 |
| aliphatic C16-C21     | 10                | <7-155                                       | LQM/CIEH S4UL 5000 <sup>2</sup>                                            | None                 |
| aliphatic C21-C35     | 10                | <7-1504                                      | LQM/CIEH S4UL 5000 <sup>2</sup>                                            | None                 |
| aromatic C6-C7        | 10                | <0.1                                         | LQM/CIEH S4UL 70                                                           | None                 |
| aromatic C7-C8        | 10                | <0.1                                         | LQM/CIEH S4UL 130                                                          | None                 |

| Contaminant      | Number of Samples | Range of Concentrations (mg/kg or indicated) | Soil standard adopted and concentration (residential) (mg/kg or indicated) | Exceedances |
|------------------|-------------------|----------------------------------------------|----------------------------------------------------------------------------|-------------|
| aromatic C8-C10  | 10                | <0.1                                         | LQM/CIEH S4UL 34                                                           | None        |
| aromatic C10-C12 | 10                | <0.2-8.1                                     | LQM/CIEH S4UL 74                                                           | None        |
| aromatic C12-C16 | 10                | <4                                           | LQM/CIEH S4UL 140                                                          | None        |
| aromatic C16-C21 | 10                | <7-82                                        | LQM/CIEH S4UL 260                                                          | None        |
| aromatic C21-C35 | 10                | <7-1278                                      | LQM/CIEH S4UL 1100                                                         | TP08 0.2m   |

**Notes to table:**

LQM / CIEH: Generic assessment criteria published by Chartered Institute of Environmental Health and Land Quality Management Ltd, residential with plant uptake scenario (1% SOM); copyright Land Quality Management Ltd reproduced with permission publication number S4UL3102. All rights reserved.

DEFRA plant Threshold guideline for the protection of sensitive plant species used by MAFF  
<sup>1</sup>: CV exceeds solubility saturation limit provided in (), i.e. possibility of free product at this level  
<sup>2</sup>: Maximum limit of 5000mg/kg used for reasons of amenity

7.2.7. Elevated concentrations above residential soil screening values occurred in three locations, as below; all other samples were uncontaminated.

- TP03 – Made Ground for lead;
- TP08 – Made Ground for arsenic, lead, and certain fractions of aromatic hydrocarbons, all of which are likely to be associated with waste material present in TP08 down to 2.2m.

7.2.8. Specific SOM tests revealed an organic content in Made Ground of between 1.4% and 34.6%. The two incidences of highly elevated content in excess of 30% were recorded within Made Ground (ash) in TP03 and TP08. This is likely to be due to the presence of uncombusted coal or coke in the ash.

7.2.9. Soil pH varies between 4.91- high acidity to 8 – alkaline.

7.2.10. Asbestos was not identified in soil samples in any location, however analysis results from samples of discrete fragments of suspect materials present in the tip areas indicated the presence of chrysotile in the form of cement sheeting.

### 7.3. Results of Groundwater Analysis

7.3.1. There are no existing water quality standards for groundwater. As the main pollution risk from the site was considered to be impacts on local surface watercourses, groundwater results are compared against Environmental Quality Standards (EQSs) provided for surface waters<sup>1</sup>. Where an EQS has not been published under the WFD, reference has been made to the EQSs referred to under the EC Dangerous Substances Directive 76/464/EEC. Maximum allowable concentrations are used for “priority substances” and long-term mean standards for “Specific Pollutants”

7.3.2. In the absence of an EQS reference has been made to the standards provided for groundwater

<sup>1</sup> Water Framework Directive (Standards & Classification) Directions (England & Wales) 2015

drinking water protected areas or in the Water Supply (Water Quality) Regulations 2000, (typically referred to as the UK Drinking Water Standards or UK DWS). It should be noted that these are particularly stringent as they are used to protect drinking water consumers and hence, although they provide an indication of the presence of any contamination, they are not necessarily directly applicable to risks posed to receptors associated with the site itself.

7.3.3. Three groundwater samples were collected from two springs on site and water supply draining groundwater from on-site, located immediately southwest of the site border. The results of groundwater analysis are summarized below:

**Table 7.2: Summary of Groundwater Results**

| Determinant           | Number of samples | Range of Concentrations (µg/l) | Quality standard adopted and concentration (µg/l) | Exceedances |
|-----------------------|-------------------|--------------------------------|---------------------------------------------------|-------------|
| EPH (C8-40)           | 3                 | <10                            | 10 DWS                                            | None        |
| Dissolved Arsenic     | 3                 | <2.5                           | 50 EQS WFD                                        | None        |
| Dissolved Cadmium     | 3                 | <0.5                           | 1.5 EQS WFD <sup>1</sup>                          | None        |
| Dissolved Copper      | 3                 | <7 – 16                        | 28 EQS WFD <sup>1</sup>                           | None        |
| Dissolved Lead        | 3                 | <5 – 9                         | 14 EQS WFD <sup>1</sup>                           | None        |
| Dissolved Nickel      | 3                 | <2– 8                          | 34 EQS WFD <sup>1</sup>                           | None        |
| Total Chromium        | 3                 | <1.5 – 5                       | 4.7 GW                                            | Spring 1    |
| Total Zinc            | 3                 | 19 – 23                        | 125 EQS WFD <sup>1</sup>                          | None        |
| Mercury               | 3                 | <1                             | 0.07 EQS WFD <sup>1</sup>                         | LOD > EQS   |
| Hexavalent Chromium   | 3                 | <6                             | 3.4 EQS WFD                                       | LOD > EQS   |
| Naphthalene           | 3                 | <1                             | 130 EQS WFD                                       | None        |
| Acenaphthylene        | 3                 | <0.5                           | No EQS                                            | N/A         |
| Acenaphthene          | 3                 | <1                             | No EQS                                            | N/A         |
| Fluorene              | 3                 | <0.5                           | No EQS                                            | N/A         |
| Phenanthrene          | 3                 | <0.5                           | No EQS                                            | N/A         |
| Anthracene            | 3                 | <0.5                           | 0.1 EQS WFD                                       | LOD > EQS   |
| Fluoranthene          | 3                 | <0.5                           | 0.12 EQS WFD                                      | LOD > EQS   |
| Pyrene                | 3                 | <0.5                           | No EQS                                            | N/A         |
| Benzo(a)anthracene    | 3                 | <0.5                           | No EQS                                            | N/A         |
| Chrysene              | 3                 | <0.5                           | No EQS                                            | N/A         |
| Benzo(bk)fluoranthene | 3                 | <1                             | 0.0017 EQS WFD                                    | LOD > EQS*  |
| Benzo(a)pyrene        | 3                 | <1                             | 0.27 EQS WFD                                      | LOD > EQS*  |
| Indeno(123cd)pyrene   | 3                 | <1                             | No EQS                                            | LOD > EQS * |
| Dibenzo(ah)anthracene | 3                 | <0.01                          | 0.002 EQS WFD                                     | LOD > EQS * |
| Benzo(ghi)perylene    | 3                 | <0.5                           | 0.002 EQS WFD                                     | LOD > EQS*  |
| Carbazole             | 3                 | <0.5                           | No EQS                                            | N/A         |
| Dibenzofuran          | 3                 | <0.5                           | No EQS                                            | N/A         |

Notes:

EQS: National Environmental Quality Standard for inland surface waters, maximum allowable concentration or long-term mean



|               |                                                                             |
|---------------|-----------------------------------------------------------------------------|
| UK DWS:       | Water Supply (Water Quality) Regulations 2000                               |
| LOD           | Limit of detection; variable for individual VOCs and SVOCs                  |
| <sup>1.</sup> | Hardness related; reference made to hardness band 50 Ca mg/l                |
| *             | For this group of priority substances benzo(a)pyrene is considered a marker |
| HCN           | Value for hydrogen cyanide                                                  |
| GW            | Groundwater Threshold Values for UK River Basin Criteria                    |

7.3.4. Concentrations of metals were generally low, with the only slight exceedance of total chromium in Spring 1. In the absence of likely pollution sources for this substance, this value is considered unlikely to pose any risks to controlled waters and may be natural in origin.

7.3.5. Potential exceedances of some PAHs cannot be determined due to limits of detection (LOD) higher than EQS standard values. None of the wide range of other organic (VOCs & SVOCs) were detected above the respective LODs.

#### 7.4. Results of Soluble Sulphate Analysis and pH

7.4.1. Chemical tests on selected soil samples have recorded soluble sulphate concentrations ranging from <1.5mg/l to 0.168mg/l and pH values ranging from 4.91 to 8.0.

7.4.2. The groundwater samples have recorded values of sulphate concentrations ranging from 0.55mg/l to 15.41mg/l and pH values ranging from 5.96 to 7.17.

## 8. Geotechnical Assessment

### 8.1. General

8.1.1. We understand the proposed development comprises the construction low-rise residential dwellings with supporting infrastructure and that the site will have to be regraded to sensibly level development platforms and appropriate gradients for access roads.

8.1.2. The exploratory work from this investigation has proven the expected general strata sequence comprising sand, clay and locally gravel of Hummocky Glacial Deposits locally overlain locally by Made Ground and alluvium in a small but significant minority of entries. Where present in the entries completed to date, Made Ground thickness varies between 0.7m and 2.2m.

8.1.3. Topsoil occurs as a veneer down to depths of between 0.25m and 0.7m, typically 0.4m.

8.1.4. Very soft clay was observed in TP08 and TP13 overlain by Made Ground. Very soft clay underlies deeper Made Ground on site, of 1.8m and 2.2m thickness. In the case of TP13, due to elevated thickness of overlying Made Ground in comparison to the rest of the site, proximity of the motorway A627(M) and historical earthworks it is deemed that layers of very soft clay are a product of earthworks in the area and this deposit may comprise a substantial volume present over a large area in the southwest of the site. The total depth of this deposit was not proved but changes to historical contours indicates it may be several meters thick.

8.1.5. Thin alluvium layers were observed only in TP03 and TP05 with thickness of 0.4m and 0.8m following the local water course on the western part of the site.

8.1.6. The groundwater is typically observed in low-lying areas at depths between 0.6m and 2.7m depending upon ground elevation and preferential groundwater flows into a water course on the western part of the site, local springs feed minor watercourses, piped water supplies and ultimately the ponds and river to the south.

8.1.7. Only classification tests were performed on retrieved samples. At this stage resistance and deformation testing was not carried out. Discussion of the soils geotechnical properties is therefore based solely on site observations, laboratory classification testing results and the application of commonly adopted principles generally.

### 8.2. Site Excavation

8.2.1. Conventional hydraulic plant should be satisfactory for excavating foundation and service trenches within the encountered deposits.

8.2.2. In line with HSE guidelines, all excavations requiring personnel access should be adequately supported to avoid the risk of collapse. Excavations within the Hummocky Glacial Deposits over the groundwater level are likely to remain stable in the short term. Excavations below the

groundwater level are likely to be unstable.

8.2.3. Groundwater is expected to be encountered as seepages at depths greater than about 0.6m in low-lying areas and dewatering may be required. Conventional pumping from sumps should be satisfactory in order to maintain a dry excavation. Problems of running sand and loss of fines potentially may be expected.

8.2.4. Shallow excavations in elevated areas are likely to remain dry in the short term. It should be appreciated however that seasonal variations may exist and hence groundwater entries may occur particularly during wetter months or after periods of inclement weather.

### 8.3. Foundation Solutions

8.3.1. The Made Ground, identified in at least two areas, is considered unsuitable as a bearing stratum due to its variability, and potential for unacceptable total and differential settlement under applied foundation loadings.

8.3.2. The very soft clay (possible fill) encountered in the holes TP08 and TP13 below Made Ground is not considered suitable as a bearing stratum due to potential for unacceptable settlement. Where encountered beneath proposed structures it is recommended that the Made Ground is dug out and replaced with suitable engineered fill. This is likely only to be appropriate where Made Ground deposits are thin; less than 2-3m.

8.3.3. Ground improvement using replacement with granular fill may be considered in deleterious areas where Made Ground is underlain by very soft clay (possible fill in TP08 and TP13), as an alternative to shallow foundations. However, the depths of strata must be confirmed at depth in further ground investigation.

8.3.4. Alluvial deposits are indicated to be present along the water courses in the western part of the site and are likely to be encountered in other low-lying areas. Alluvium tends to have low bearing (presumed allowable bearing pressures of circa 50kPa-100kPa, but often less) and high compressibility, with the potential for long term creep characteristics if the clays are very soft or have a high organic content.

8.3.5. The thickness of Alluvium proven to date on site varies between 0.4m and 0.8m, and it is probably highly localised, therefore it is recommended, as Made Ground and fill, it is either dug out or replaced where encountered beneath proposed paved areas or structures. The excavated material is not normally acceptable for re-use as an engineered fill given its low strength, high moisture content, and often high organic content.

8.3.6. The Hummocky Glacial Deposits, sand and clay, are considered not to pose significant

engineering problems. Although not confirmed by in-situ or laboratory testing, this material is likely to be a suitable bearing stratum for conventional shallow foundations at not less than 0.75m below existing ground level in clay or 0.20m into the top of the formation, whichever is the deeper.

8.3.7. At this stage bearing capacity cannot be assessed due lack of resistance in-situ or laboratory testing. However rough estimations based on observation during the excavation of trial holes could indicate possibly medium dense sands and gravels (not confirmed with SPT testing), and firm to stiff clay, except soft becoming firm clay in TP12.

8.3.8. Typical possible values for this kind of Glacial deposits are likely to have the bearing capacity of approximately of 150kPa, considering the upper weathered layers to have bearing capacity in most cases lowered to 80kPa. These roughly estimated values are not confirmed by any resistance in-situ or laboratory testing and should be considered as a preliminary indication.

8.3.9. Where structures are placed on the granular materials it is assumed all settlement will take place almost immediately as the loading is imposed. However, if cohesive layers are present in the materials (TP06, TP07, TP12 and TP18) these may reduce the bearing capacity and introduce a time element to settlements that will need to be considered in design (although the granular nature of the surrounding materials tends to produce drainage paths and therefore improve consolidation rates).

8.3.10. Classification tests on selected samples of cohesive layers of Hummocky Glacial Deposits classified as a soil of low and medium volume change potential. See NHBC Building Standards, Chapter 4.2.

8.3.11. Where foundations are to be constructed in clays within the vicinity of trees or shrubs on this site then they will require deepening in accord with guidelines given in NHBC Building Standards Chapter 4.2. In order to minimise differential settlement of spread foundations spanning sand and localised clay deposits it is recommended that light reinforcing be placed in the base of foundation excavations to avoid the occurrence of localised movement.

8.3.12. Ground floor slabs: provided all the Topsoil and Made Ground is stripped off, ground bearing floor slabs could be constructed placed on a layer of well compacted granular fill over the natural sand, suspended floors may have to be considered elsewhere.

#### 8.4. Regrading & Preparatory Earthworks

8.4.1. The above assessment on foundations is based on a formation level concurrent with existing surfaces. However, the site presents uneven topography related to Hummocky Glacial Deposits, for future development the site will be regraded to accommodate dwellings, gardens and provide acceptable gradients for access roads.

- 8.4.2. The previous bearing capacity estimations are only based on the preliminary site investigation which was carried out from current ground surface levels; the site will undergo considerable grading consequently adequate assessment of bearing capacities should be done for the regraded site.
- 8.4.3. For fill areas, the specification will typically require that the in-situ density is a percentage of maximum dry density, usually 95%. It is recommended Proctor test to be performed in order to determine optimum dry density to inform the required compaction regime for placed engineered fills. The strength of the formation for road construction will usually be specified as a percentage California Bearing Ratio.
- 8.4.4. Areas of made ground, and soft soils, specifically alluvium and soft clays may be less amenable to disturbance and the design of the overall earthworks should take into account any re-distribution of these materials and their effect on the proposed layout.
- 8.4.5. Earthworks potentially will affect the slope stability; typical grading-related problems include differential performance at cut-fill transitions; landslides created by filling at the head or cutting at the toe of a natural slope; soil creep; settlement, differential settlement, or heave of fills; heave of potentially expansive clayey layers in cuts, and diversion of surface drainage. Grading the site can exacerbate hidden existing stability problems and mask natural topographic indications of potential hazards such as existing landslides
- 8.4.6. Cuts potentially will intercept zones of groundwater, which can cause problems ranging from nuisance seepage to slope instability and possible running sand conditions where sand loses its effective pressure. During the preliminary site investigation seepages and inflows were observed at approximate ground elevations between 152m and 167m aod.
- 8.4.7. It is advised to bear in mind that clay layers within sand may create lubrication surfaces and preferential filtration paths along the contacts between clay and sand.
- 8.4.8. Shallow excavations within the Hummocky Glacial Deposits over the groundwater level are likely to remain stable in the short term. Excavations below the groundwater level are likely to be unstable, although much of the 'cut' in a large scale regrade would be anticipated to come from the higher and dryer parts of the site.
- 8.4.9. It should be appreciated however that seasonal variations may exist and hence groundwater entries may occur particularly during wetter months or after periods of inclement weather.
- 8.4.10. Fills in areas of existing watercourses, especially the watercourse located on the western part of the site, can block watercourses, causing sedimentation and posing a risk of upstream and downstream flooding. Impeded or exacerbated flows of groundwater through newly placed fill

materials could alter the hydrogeological regime sufficiently to cause instability. An appropriate drainage design scheme for the site must be integrated into the preparatory earthworks scheme to ensure that medium to long-term stability risks are not created from the interaction of groundwater flows with the newly created geomorphology of the site.

#### 8.5. Re-use of material on site.

8.5.1. The large scale earthworks anticipated as required to provide suitable development platforms and acceptable gradients is anticipated to involve the use of site generated materials, usually a balance of cut and fill is desired to prevent costs and unsustainable use of resources in terms of waste generation and use of resources.

8.5.2. The excavations on site from foundation and services trenches will produce a considerable amount of surplus soil. Under current waste management legislation if this soil is surplus to requirements it will be classified as waste and needs disposing of at a licensed facility. However, if consideration of this is made during the site reprofiling design then some or all of the arisings may be able to be re-used on-site in an area left purposely low to accommodate the materials.

8.5.3. Based upon the human health and groundwater risk assessments, the soils on this site are considered to be suitable to be re-used on site for landscaping purposes, and placement of materials during both the preparatory earthworks and the construction stage of redevelopment would usually be covered by a materials management Plan (MMP) under the Definition of Waste: Development Industry Code of Practice. Surplus disposal or import requirements may also be covered by such a scheme as long as only natural uncontaminated materials are transferred between development sites.

#### 8.6. Subsurface Concrete

8.6.1. The chemical test results are assessed in accord with BRE Special Digest 1 and appropriate action taken for any new sub-surface concrete requirements.

8.6.2. Chemical tests on selected soil samples have recorded soluble sulphate concentrations ranging from <0.0015g/l to 0.168g/l and pH values ranging from 4.91 to 8.0. This would correspond to a Design Sulphate Class of DS-1.

8.6.3. In terms of BRE Special Digest 1, the land has never been developed and may be considered to be natural ground. The groundwater beneath the site should be considered as mobile.

8.6.4. The results correspond to Aggressive Chemical Environment for Concrete (ACEC) class AC-1, for locations TP05, TP06, TP07, TP15 and TP17 the results correspond to ACEC class AC-2z.

## 9. Revised Conceptual Model and Risk Assessment

### 9.1. Methodology

9.1.1. Information from the current site investigation has been used to refine the likely source-pathway-target relationships identified in the preliminary Conceptual Site Model (CSM). Tier 1 risk assessment has been undertaken by comparison of contaminant concentrations in various media (soil and ground water) to generic screening criteria. These are values appropriate to the intended residential end-use of the site, and indicate whether potentially unacceptable risks to receptors are likely to exist, requiring either more detailed site-specific risk assessment or remediation to break the potential contaminant linkage.

### 9.2. Source Risk Assessment

9.2.1. The desk study assessment of the site identified no significant development to have taken place on the site. Surrounding past and current land uses have not been identified as likely to pose a significant risk to the redevelopment of the site as housing, however industrial buildings development is identified north of Cripple Gate Lane and A627(M) construction in the late 60s and early 70s.

9.2.2. A pond in north of the site appears to have been in-filled around 60 years ago. This could contain waste materials, although readily degradable materials would be expected to have largely broken down in the intervening period. No other potentially contaminative activity is known to have occurred on the site. Off-site sources are considered to present similarly low risk.

9.2.3. At least three areas of tipped inert waste materials have been encountered; one of these might be associated with the pond and anecdotally two areas of the site have received waste in historical 'tips'. Based on the observations much of the material is ash, clinker and coke with smaller quantities of industrial wastes.

9.2.4. Analysis from the areas indicate concentrations of arsenic (encountered in TP08), copper and lead (encountered in TP03 and TP08), nickel (in TP08) and zinc (in TP02 and TP08), which might be unacceptable in a garden area. Analysis of samples of discrete fragments of suspect materials for asbestos has indicated the presence of asbestos cement sheeting and observations indicate that this material may be widespread in the three areas of tipped materials identified to date; the presence of similar materials elsewhere cannot be discounted.

9.2.5. These comprised principally inert materials and as such are unlikely to be a significant source of ground gas. Within two locations, TP08 and TP13, a greater thickness of very soft clay was encountered. One of these is interpreted as a result of earthworks for the A627(M) and may represent similar conditions over a substantial part of the southwest of the site.

9.2.6. There were no exceedances of screening criteria associated with natural ground (topsoil).

9.2.7. Groundwater sampling and analysis encountered relatively low exceedances of screening criteria within Spring 1 for total Chromium.

9.2.8. Groundwater from the site is likely to migrate towards the south and the southwest in the direction of the watercourse trending north – south located on the western part of the site and towards the existing ponds located south and southeast.

### 9.3. Potential Targets

9.3.1. The principal vulnerable receptors, following residential development of the site will be:

- construction workforce;
- future site users (residents);
- on-site building structures and infrastructure (buildings; roadways; services);
- soft landscaping areas (gardens); and,
- neighbouring residential properties;
- ground water;
- surface waters.

9.3.2. Controlled waters (groundwater and surface waters) are not considered to be potential targets due to the classification of both solid and drift geology in the area as unproductive and the apparent absence of viable pollution sources within the site.

### 9.4. Human Health Risk Assessment

9.4.1. Potential risks identified are limited to those associated with direct exposure to the ashy made ground present in multiple, but laterally limited areas. The short term and transient effect on construction and maintenance workers is considered minimal but concentrations are higher than screening criteria for gardens where more frequent and longer term exposure of more sensitive children may take place

9.4.2. Asbestos cement sheeting has been identified in areas of tipped made ground, the material is broken up and could present a risk to both construction operatives and future residents if it remains exposed and subject to mechanical disturbance (excavation, trafficking, wind erosion, etc.).

### 9.5. Property Risk Assessment

9.5.1. To our knowledge the development of the site will comprise buildings (houses), car parking, drainage infrastructure, utility services and areas of soft landscaping (gardens). An assessment of the site for aggressive ground conditions has identified a low likelihood on concrete attack,



and as such a concrete design class recommendation of DS-1 AC-1 and AC-2z has been made. Further assessment may be required on a more detailed basis within housing footprints.

9.6. Controlled Waters Risk Assessment

9.6.1. Concentration of total Chromium have slightly exceeded GW value within the Spring 1. Both the solid and drift geology in the area are classified by the EA as unproductive strata, and as such are not considered to be at risk from the marginal contamination identified on the site. The nearest surface water feature is located on the western part of the site. Other surface water features, including ponds are located south and southeast of the site. Considering marginal exceedance of total Chromium surface waters are not likely to be at risk.

9.7. Site Conceptual Model

9.7.1. Potential pollution linkages between the identified contamination sources and existing and future receptors are summarised in Table 9.1 below:

**Table 9.1: Revised Conceptual Site Model**

| Hazardous Source                                                                             |                                                                                                                                                       | Receptor                                                                                            | Pathway                                                                                                                | Risk Assessment |             |            | Notes                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|-----------------|-------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Origin                                                                                       | Contaminant                                                                                                                                           |                                                                                                     |                                                                                                                        | Consequence     | Probability | Risk       |                                                                                                                                                                                                                                                                                                                                                                                  |
| Hazardous substances present as discrete deposits as a result of uncontrolled waste disposal | metals, PAHS, fuels, oils, organic pesticides and asbestos present as discrete deposits within made ground as a result of uncontrolled waste disposal | current / future site users including residents, construction workers / future maintenance workers  | direct contact / dust & soil ingestion and inhalation                                                                  | severe          | unlikely    | <b>low</b> | Slight exceedance of metals within Made Ground encountered in TP03 and TP08, these materials, and other similar materials on the site would require exclusion from future garden areas as would the asbestos cement sheeting identified in the tip areas, however the natural topsoil present on the site appears likely to be suitable for inclusion in gardens such a scenario |
|                                                                                              |                                                                                                                                                       | Controlled water receptors, mainly the watercourse to the south and its tributaries within the site | leaching and infiltration through unsaturated zone, enrichment of groundwater and discharge into the site watercourses | medium          | unlikely    | <b>low</b> | No significant contaminants encountered.                                                                                                                                                                                                                                                                                                                                         |
| Hazardous ground gas from sources within made ground or similar off-site sources             | Methane, carbon dioxide, carbon monoxide and depressed oxygen conditions                                                                              | Site workers: construction stage or future maintenance workers                                      | inhalation risk                                                                                                        | severe          | unlikely    | <b>low</b> | No significant risk is expected.                                                                                                                                                                                                                                                                                                                                                 |
|                                                                                              |                                                                                                                                                       | future site users / unventilated voids in future buildings                                          | inhalation risk                                                                                                        | severe          | unlikely    | <b>low</b> |                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                              |                                                                                                                                                       | Buildings and structures                                                                            | Accumulation to explosive concentrations                                                                               | severe          | unlikely    | <b>low</b> |                                                                                                                                                                                                                                                                                                                                                                                  |

Note: Risk Assessment based on guidance provided in CIRIA 552, 2001, 'Contaminated Land Risk Assessment: Guide to Good Practice'

## 10. Conclusions and Recommendations

### 10.1. Conclusions: Contamination

10.1.1. The historical uses of the site appear to have been solely agricultural. No significant potential natural or manmade sources of contamination have been identified within or adjacent to the site. Apart from some, probably small scale tipping of ashy but largely inert industrial wastes in at least three parts of the site soils would generally be suitable for inclusion in future garden areas.

10.1.2. A more widespread area of made ground may be present in the southwest of the site, however this is likely to comprise mainly re-worked natural materials associated with the construction of the adjacent motorway, and as such is likely to be dominated by reworked natural soils with a low potential for contamination.

10.1.3. No asbestos was identified in tested samples. However, there is always the possibility of discreet deposits of asbestos containing materials within the Made Ground and some fragments of asbestos cement sheeting have been identified to date which will need to be removed or isolated before the introduction of new receptors (including both construction operatives and residents) before disturbance and exposure can occur.

10.1.4. The ground investigation and consequent laboratory testing confirmed no significant presence of highly mobile contaminants and low likelihood of risk of any pollution associated with the site.

10.1.5. There is limited potential for the presence of other contaminants and pollutants; if uncontrolled waste deposition has occurred on the site there is a low potential for hazardous substances or materials within infilled pits, ponds etc. Volumes of impacted materials are likely to be limited within the context of the overall potential development area. The land surrounding the site does not appear to have been subject to significant polluting industrial land use or surface tipping, and migration from sources in the nearby environment is probably precluded by the local hydrological and hydrogeological gradients.

10.1.6. The site is therefore currently assessed as presenting generally low risks associated with land contamination, where these do exist they are likely to be limited in extent and readily managed in the context of redevelopment of a site of the scale of that under consideration.

### 10.2. Conclusions: Stability

10.2.1. The ground on the site appears to be dominated by undisturbed natural granular strata which has been assessed as generally unlikely to cause instability due to compressible, collapsible or otherwise unstable soils away from steep valley sides and low-lying areas where interactions with the shallow water table and the presence of local deposits of soft soils or made ground may

cause instability. Outside of these areas traditional strip foundations and ground bearing slabs are likely to be appropriate minimising abnormal groundworks costs.

10.2.2. The site is likely to require significant regrading to achieve viable development levels and gradients. Although low or very low risks from ground stability hazards have been identified associated with the dominant granular soils present over much of the site, the combination of large scale earthworks with the presence of soft deposits in valley bases, areas of made ground/fill, and shallow groundwater and associated springs and issues, requires further assessment to allow design of development foundations and infrastructure.

10.2.3. In particular, the interaction between the areas of potentially soft or heterogeneous ground (in the tips and low-lying/infilled areas identified), preparatory earthworks scheme, proposed layout and drainage/hydrogeological regime will require careful consideration

### 10.3. Conclusions: Other Constraints

10.3.1. The high pressure gas main and overhead electricity cables are existing constraints within the site; externally the impacts on the development from noise and pollution from the nearby major roads and nearby industrial/commercial land use should be taken into consideration.

10.3.2. The declared AQMA encompassing the site may present a constraint to residential development that could require assessment and possible mitigation measures. Mitigation might entail the adoption of a stand-off zone for development near to the motorways.

### 10.4. Recommendations

10.4.1. While it can be recommended that the dominant granular soils on the site are likely to make them acceptable as a bearing stratum at shallow depth, this requires confirmation by further investigation and a number of constraints do exist including the presence of substantial areas of softer or otherwise heterogeneous soils.

10.4.2. Where structures are placed on the natural, undisturbed granular materials it is assumed all settlement will take place almost immediately as the loading is imposed. However, if cohesive layers are present these may reduce the bearing capacity and introduce a time element to settlements that will need to be considered in design. The selection of foundation solution will require appropriate design, supervision and validation at the preparatory earthworks stage, particularly for areas where levels are to be raised.

10.4.3. To fully characterise the geotechnical properties of the ground, and inform the preparatory earthworks scheme some further more detailed investigations will be required.

10.4.4. The depths of very soft clay (possible fill) were not confirmed beyond 3.1m and 3.4m. It is

recommended drilling techniques are applied to confirm soil variations and attempt to delineate the lateral extent of the deposits, further trial trenching may also be useful in this regard. Similarly, the extent of the tips may be determined by trenching to produce an accurate volume of the materials which must be isolated from future garden areas.

10.4.5. Additional detailed intrusive investigation is likely to include drilling deeper boreholes with SPT in-situ testing to at least 6m below the floor levels of proposed dwellings (where foundations are likely to be at, or below existing levels). Samples should be collected of soils above potential regrade surfaces to assess the amenability of the materials for placement as engineered fill in the low-lying areas (where foundations are likely to be above existing levels).

10.4.6. Consideration should be given to undertaking additional sulphate testing across the site on a more detailed basis within the proposed building footprints.

10.4.7. The drainage requirements for any development should be considered carefully: the presence of a number of springs, groundwater levels observed in trial pits indicate the presence of a shallow water table and locally saturated ground in low-lying areas, and should inform the geotechnical assessment of the site given the implications for local instability and running sands.

10.4.8. A hydrological assessment to determine the drainage requirements for the site following any planned redevelopment, and any attenuation to reduce impacts downstream should be carried out. The existing high risk of surface water flooding in two small areas of the site should inform the drainage proposals. An assessment of the feasibility of soakaways should form part of the intrusive site investigation, as although the superficial deposits are largely granular soakaways should be feasible. For many parts of the site.

10.4.9. Consultation with the Animal & Plant Health Agency should take place before any excavations in farmland but in any case, the provision set out in the DEFRA "Code of Practice for Civil Engineers, Surveyors and Contractors: Precautions to Prevent the Spread of Animal & Poultry Disease" should be adhered to.

10.4.10. The high pressure gas main present in the east of the site probably forms a significant constraint to development as it will require a substantial stand-off and/or diversion. Given the size of the site it may be cost effective to leave the surrounding land as open space, however the depth to the pipe must be taken into consideration when designing local regrade levels. In the context of a large development, diversion could be considered, particularly if the pipeline requires upgrading or replacement in any case. A stand-off, diversion or rerouting to underground cables could be considered for the overhead electricity lines present on the site. Searches for the presence of other services will need to be carried out.

10.4.11. Topsoil won from the site should only require screening for contaminants at a relatively low frequency and there is no current evidence that measures such as clean cover systems, gas protection or source removal/treatment will be required.

10.4.12. An asbestos survey of the dilapidated buildings near the northwest corner of the site should be carried out prior to demolition and clearance; however asbestos cement sheeting has been identified in the made ground in the tip areas and, the presence of damaged potential asbestos containing materials or other wastes such as drums, organic wastes or animal carcasses elsewhere within discrete deposits is possible if unrecorded waste disposal activities have been carried out.

10.4.13. Given the size of the site, and assuming that no further anecdotal evidence or official records of potential contamination sources are identified by further consultation, small deposits are unlikely to be identified by any intrusive site investigations and appropriate training of construction operatives and supervisors during development is probably the most effective means of ensuring any such constraints are identified, although the risk is considered low. Managing the contamination that has been identified to date will probably be relatively straightforward and involve sequestering the impacted material at depths, and in locations, where future disturbance would not be anticipated (outside gardens, utility corridors etc.), this would normally form part of an agreed Remediation Strategy and be carried out under the provisions of a Materials Management Plan in accordance with the 'Definition of Waste: Development industry Code of Practice'.

10.4.14. An ecological survey will be required. Consideration of noise and air quality impacts on the development from the surrounding major road infrastructure and local air pollution controls is likely to be required as is assessment of the environmental impact from the development itself. However, an air quality assessment is likely to be mandatory in any case as the site is within an Air Quality Management Area. If the development is above a specific threshold number of dwellings or area, these elements will have to form part of a wider Environmental Impact Assessment.

## 10.5. Limitations

10.5.1. The scope of assessment was selected on the basis of the available development proposals by the client, and may be inappropriate to another form of development or scheme. SGP reserves the right to alter any of the foregoing information in the event of new information being disclosed or provided and in the light of changes to legislation, guidelines and responses by the statutory and regulatory authorities.

10.5.2. This report partially reviews and relies upon information provided by others. Smith Grant LLP accepts no responsibility for advice given on the basis of incorrect factual information provided

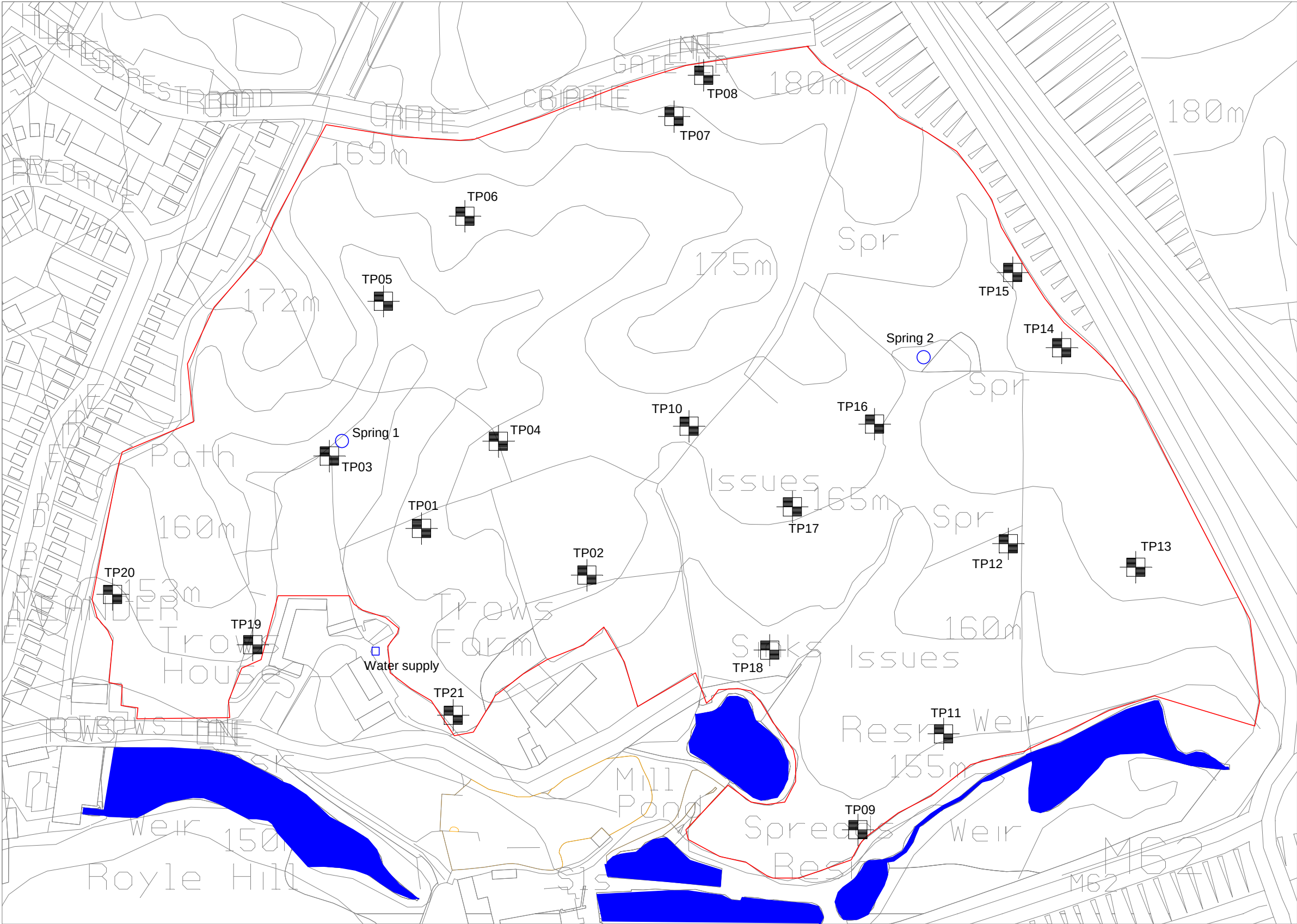
to it.

10.5.3. This report has been prepared by Smith Grant LLP, for the sole and exclusive use of GLP Ltd & Barratt Homes. The benefit of this report may not be assigned to any other party without the prior agreement in writing of Smith Grant LLP. Reasonable skill, care and diligence have been exercised within the timescale and budget available, and in accordance with the technical requirements of the brief.

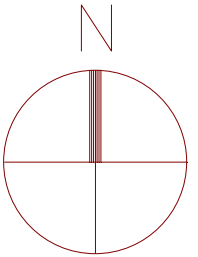
10.5.4. Notwithstanding the efforts made by the professional team in undertaking the assessment and preparing this report, it is possible that other ground conditions and contamination as yet undetected may exist. Reliance on the findings of this report must therefore be limited accordingly. Such reliance must be based on the whole report and not on extracts which may lead to incomplete or incorrect conclusions when taken out of context.

## **DRAWINGS**



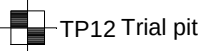


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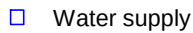


Indicative Boundary  
(based on sketch plan  
provided)

Locations of exploratory holes:



Water sampling:



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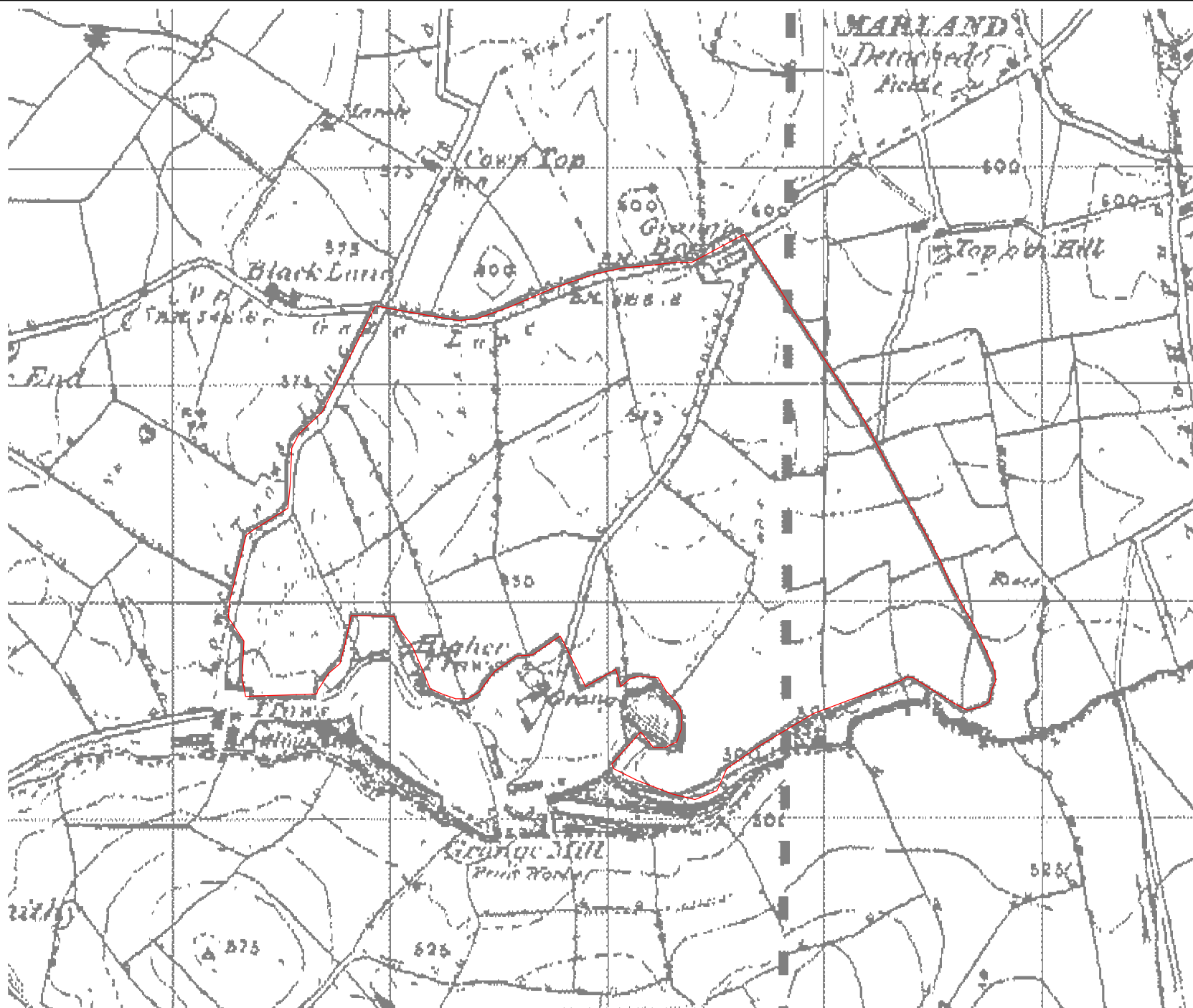
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Project:

Cowm Top, Castleton

Drawing:  
SGP Site Investigation Locations

|         |          |          |              |
|---------|----------|----------|--------------|
| Drawn:  | CS       | Checked: | BJT          |
| Date:   | 08/07/16 | Scale:   | 1:2,500 @ A3 |
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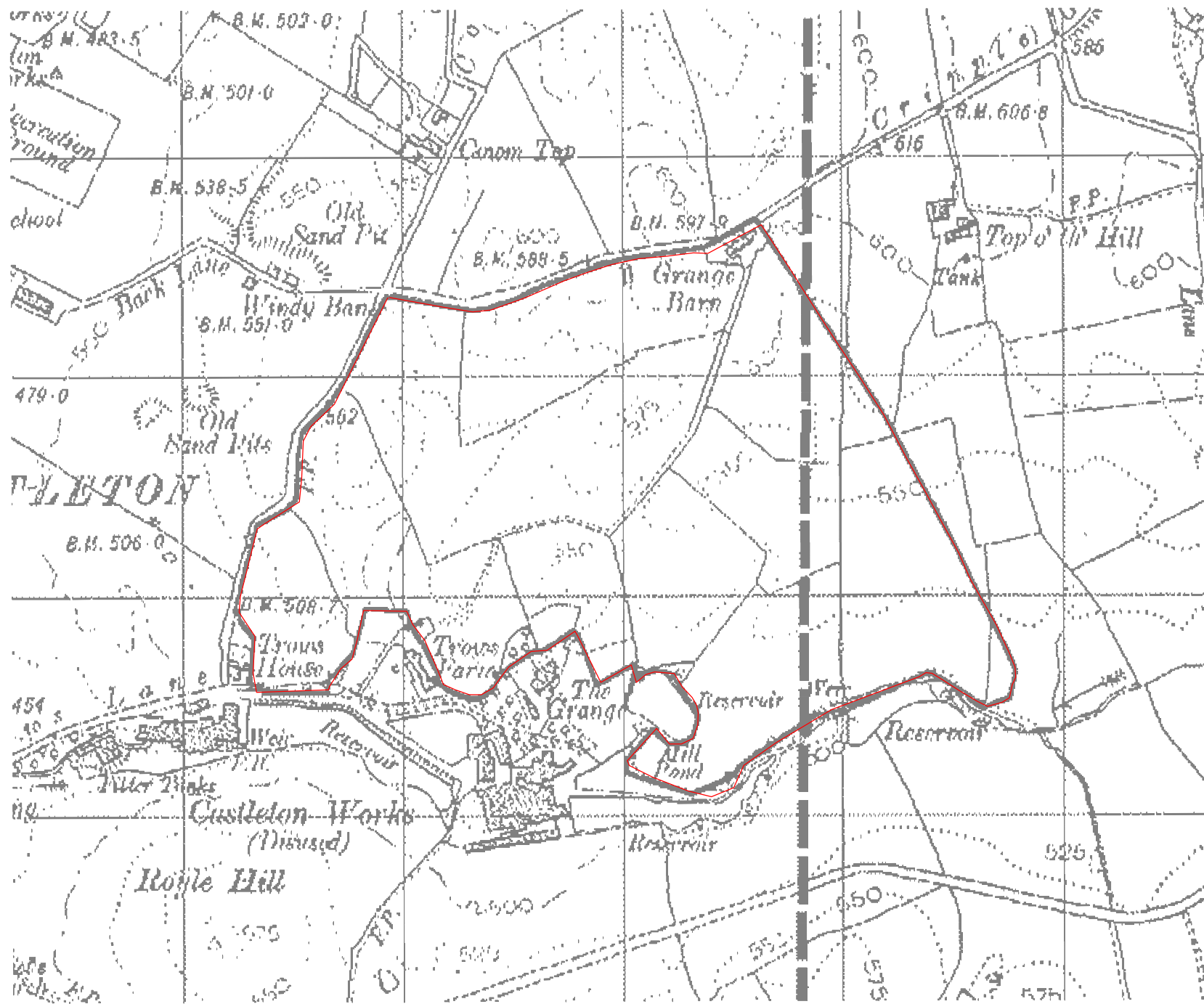
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Historical Map - 1851

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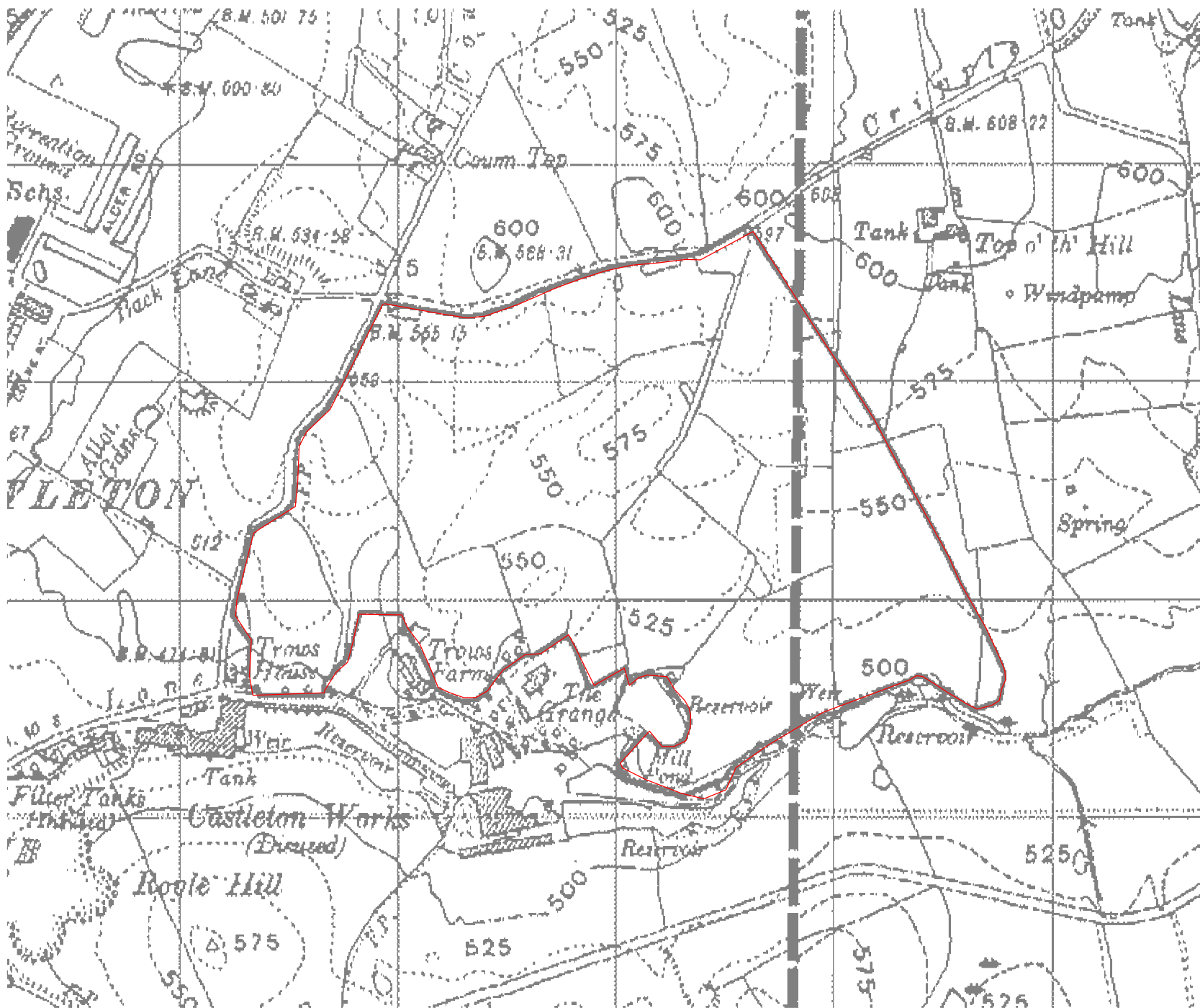
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Historical Map - 1910-11

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Historical Map - 1938

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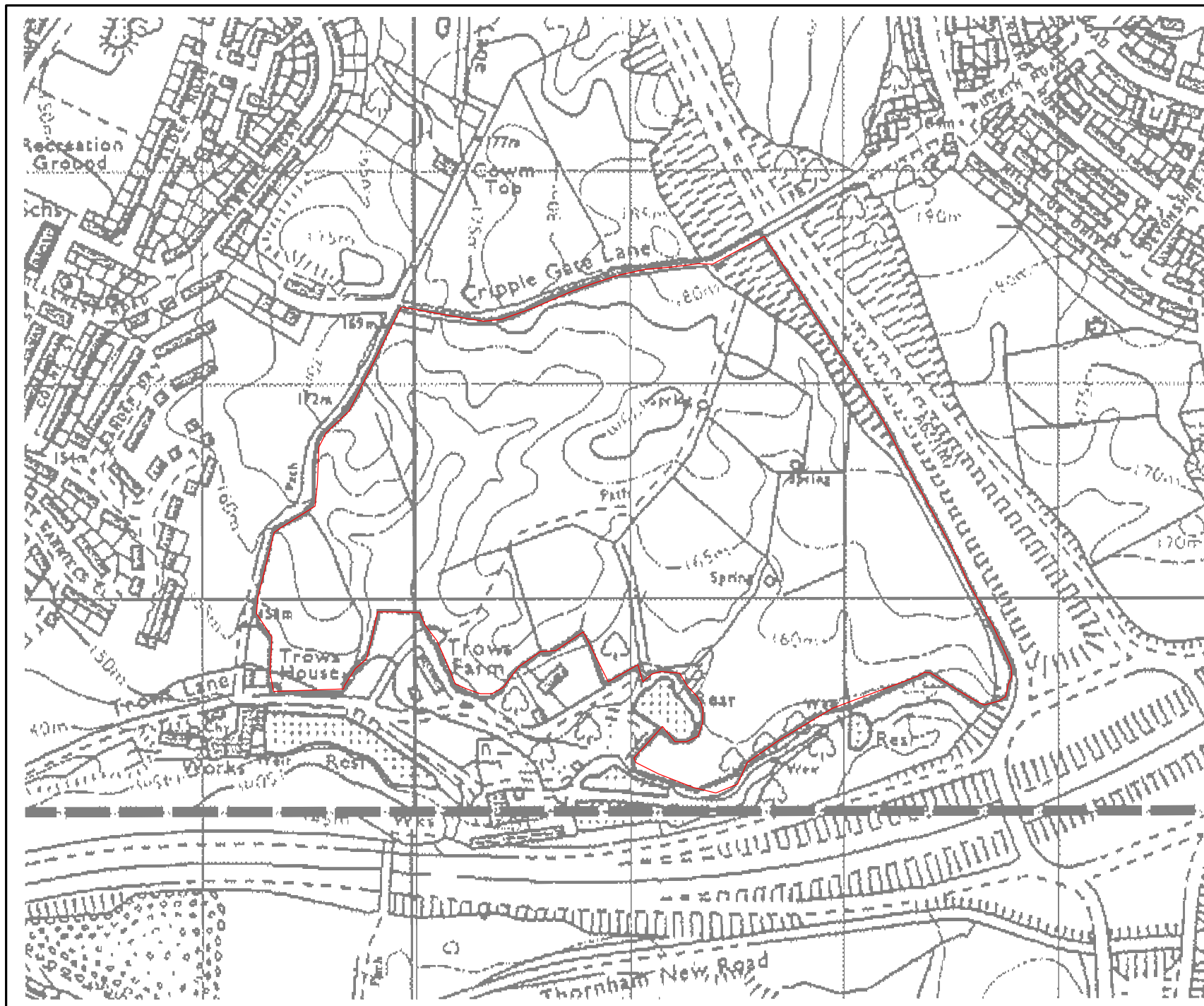
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D04







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Cowm Top, Castleton

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Historical Map - 1975-79

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04/01/16

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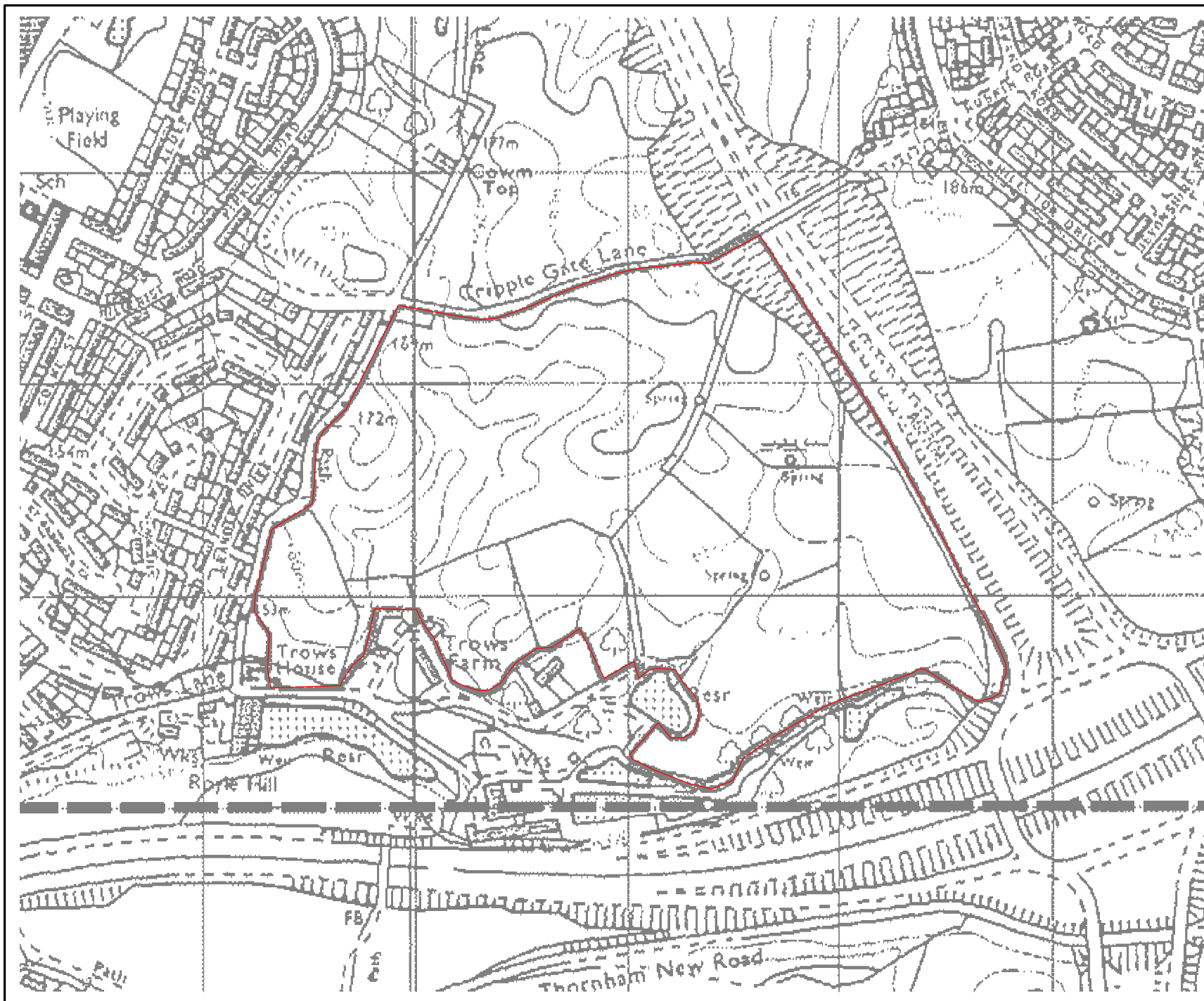
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Job No:

R2228

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Historical Map - 1983-88

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R2228

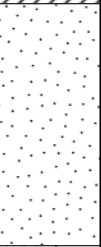
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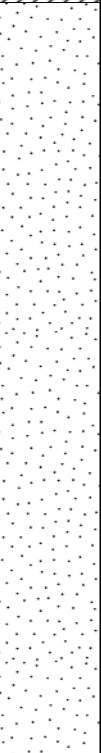
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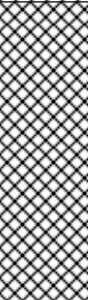
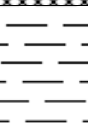
## **APPENDIX A**

### **Trial Pits Logs and Photographs**



| SHEET:<br><b>1 of 1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | LOCATION:<br><b>See Plan</b> | PROJECT:<br><b>Cowm Top, Castleton</b>                   | ENGINEER:<br><b>CS</b>                        |                                                                                                                                  | JOB NO.<br><b>R2228</b>                                                              | TRIAL PIT<br>NO.<br><b>TP01</b> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                              | EXCAVATED BY:<br><b>Yanmar 8T tracked midi excavator</b> | CLIENT:<br><b>GLP Ltd &amp; Barratt Homes</b> |                                                                                                                                  | DATE:<br><b>28-30 June 2016</b>                                                      |                                 |
| DEPTH<br>(m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | SAMPLES                      | Lab testing                                              | DEPTH<br>(m)                                  | DESCRIPTION OF STRATA                                                                                                            | LEGEND                                                                               |                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                              |                                                          | 0                                             | Black slightly clayey sandy TOPSOIL with rootlets.                                                                               |   |                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                              |                                                          | 0.4                                           | Slightly clayey slightly gravelly SAND. Gravel is fine to coarse subangular to subrounded sandstone (HUMMOCKY GLACIAL DEPOSITS). |   |                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                              |                                                          | 1.2                                           | Light brown laminated silty SAND (HUMMOCKY GLACIAL DEPOSITS).                                                                    |  |                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                              |                                                          |                                               | Base of excavation at 2.9m.                                                                                                      |                                                                                      |                                 |
| <div>  <p>Smith Grant LLP<br/>Station House, Station Road,<br/>Ruabon, Wrexham LL146DL<br/>Tel: 01978822367<br/>Fax: 019788247182<br/>www.smithgrant.co.uk<br/>email: consult@smithgrant.co.uk</p> </div> <div> <p><b>GROUND WATER:</b><br/>No groundwater encountered</p> <p><b>REMARKS:</b><br/>Sidewalls stable</p> <p>J: jar sample<br/>D: small disturbed sample<br/>B: bulk disturbed sample</p> </div> <div> <p>SCALE: <b>1:250</b></p> <p>LOGGED BY: <b>CS</b></p> <p>FIGURE NO. <b>1</b></p> </div> |                              |                                                          |                                               |                                                                                                                                  |                                                                                      |                                 |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              |                                                          |                                               |                                                                                                                                                               |                                 |                                                                                      |
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| SHEET:<br><b>1 of 1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | LOCATION:<br><b>See Plan</b> | PROJECT:<br><b>Cowm Top, Castleton</b>                   | ENGINEER:<br><b>CS</b>                        |                                                                                                                                                               | JOB NO.<br><b>R2228</b>         | TRIAL PIT<br>NO.<br><b>TP02</b>                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              | EXCAVATED BY:<br><b>Yanmar 8T tracked midi excavator</b> | CLIENT:<br><b>GLP Ltd &amp; Barratt Homes</b> |                                                                                                                                                               | DATE:<br><b>28-30 June 2016</b> |                                                                                      |
| DEPTH<br>(m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | SAMPLES                      | Lab testing                                              | DEPTH<br>(m)                                  | DESCRIPTION OF STRATA                                                                                                                                         |                                 | LEGEND                                                                               |
| 0.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | J1                           |                                                          | 0                                             | Blackish dark grey slightly clayey sandy TOPSOIL with rootlets.                                                                                               |                                 |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              |                                                          | 0.3                                           | Light brown weathered reddish brown occasionally laminated fine SAND locally slightly cemented locally with lenses of brown clay (HUMMOCKY GLACIAL DEPOSITS). |                                 |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              |                                                          |                                               | Base of excavation at 2.8m.                                                                                                                                   |                                 |                                                                                      |
| <div>  <p> <b>SMITH GRANT</b><br/> <i>Environmental Consultancy</i><br/> <b>LLP</b> </p> <p>           Smith Grant LLP<br/>           Station House, Station Road,<br/>           Ruabon, Wrexham LL146DL<br/>           Tel: 01978822367<br/>           Fax: 019788247182<br/>           www.smithgrant.co.uk<br/>           email: consult@smithgrant.co.uk         </p> </div> <div> <p><b>GROUND WATER:</b><br/>No groundwater encountered</p> <p><b>REMARKS:</b><br/>Sidewalls stable</p> <p>           J: jar sample<br/>           D: small disturbed sample<br/>           B: bulk disturbed sample         </p> </div> <div> <p>SCALE: <b>1:250</b></p> <p>LOGGED BY: <b>CS</b></p> <p>FIGURE NO. <b>1</b></p> </div> |                              |                                                          |                                               |                                                                                                                                                               |                                 |                                                                                      |

|                  |                       |                                                   |                                    |                                                                                                                      |                                                                                      |
|------------------|-----------------------|---------------------------------------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| SHEET:<br>1 of 1 | LOCATION:<br>See Plan | PROJECT:<br>Cowm Top, Castleton                   | ENGINEER:<br>CS                    | JOB NO.<br>R2228                                                                                                     | TRIAL PIT<br>NO.<br>TP03                                                             |
|                  |                       | EXCAVATED BY:<br>Yanmar 8T tracked midi excavator | CLIENT:<br>GLP Ltd & Barratt Homes | DATE:<br>28-30 June 2016                                                                                             |                                                                                      |
| DEPTH<br>(m)     | SAMPLES               | Lab testing                                       | DEPTH<br>(m)                       | DESCRIPTION OF STRATA                                                                                                | LEGEND                                                                               |
|                  | J1                    |                                                   | 0                                  | Black clayey slightly sandy TOPSOIL with rootlets.                                                                   |   |
| 0.3              |                       |                                                   | 0.1                                | MADE GROUND:Black sandy GRAVEL of slag, clinker and brick with ash.                                                  |   |
|                  |                       |                                                   |                                    |                                                                                                                      |                                                                                      |
| 1.3              | D                     |                                                   | 1.1                                | Very soft light grey slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded sandstone (ALLUVIUM). |   |
|                  |                       |                                                   | 1.5                                | Light brown fine SAND locally with lenses of brown clay (HUMMOCKY GLACIAL DEPOSITS).                                 |  |
|                  |                       |                                                   |                                    | Base of excavation at 3m.                                                                                            |                                                                                      |
|                  |                       |                                                   |                                    |                                                                                                                      |                                                                                      |



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 Fax: 019788247182  
 www.smithgrant.co.uk  
 email: consult@smithgrant.co.uk

**GROUND WATER:**

Inflow of water at 1.8m

**REMARKS:**

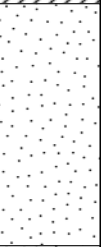
Side walls collapsing below groundwater inflow.

J: jar sample  
 D: small disturbed sample  
 B: bulk disturbed sample

SCALE: **1:250**

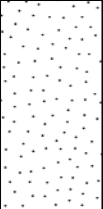
LOGGED BY: **CS**

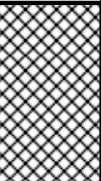
FIGURE NO. **1**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                              |                                                          |                                               |                                                                                                                |                                 |                                                                                      |
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| SHEET:<br><b>1 of 1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | LOCATION:<br><b>See Plan</b> | PROJECT:<br><b>Cowm Top, Castleton</b>                   | ENGINEER:<br><b>CS</b>                        |                                                                                                                | JOB NO.<br><b>R2228</b>         | TRIAL PIT<br>NO.<br><b>TP04</b>                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                              | EXCAVATED BY:<br><b>Yanmar 8T tracked midi excavator</b> | CLIENT:<br><b>GLP Ltd &amp; Barratt Homes</b> |                                                                                                                | DATE:<br><b>28-30 June 2016</b> |                                                                                      |
| DEPTH<br>(m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | SAMPLES                      | Lab testing                                              | DEPTH<br>(m)                                  | DESCRIPTION OF STRATA                                                                                          |                                 | LEGEND                                                                               |
| 0.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | B                            |                                                          | 0                                             | Blackish dark grey slightly gravelly sandy TOPSOIL with rootlets and occasional roots.                         |                                 |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                              |                                                          | 0.4                                           | Light brown slightly gravelly SAND. Gravel is fine to coarse subrounded sandstone (HUMMOCKY GLACIAL DEPOSITS). |                                 |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                              |                                                          | 1.2                                           | Light brown locally slightly cemented fine SAND (HUMMOCKY GLACIAL DEPOSITS).                                   |                                 |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                              |                                                          |                                               | Base of excavation at 2.8m.                                                                                    |                                 |                                                                                      |
| <div>  <p>SMITH GRANT<br/>Environmental Consultancy<br/>LLP</p> <p>Smith Grant LLP<br/>Station House, Station Road,<br/>Ruabon, Wrexham LL146DL</p> <p>Tel: 01978822367<br/>Fax: 019788247182</p> <p>www.smithgrant.co.uk<br/>email: consult@smithgrant.co.uk</p> </div> <div> <p><b>GROUND WATER:</b><br/>No groundwater encountered</p> <p><b>REMARKS:</b><br/>Sidewalls stable</p> <p>J: jar sample<br/>D: small disturbed sample<br/>B: bulk disturbed sample</p> </div> <div> <p>SCALE: <b>1:250</b></p> <p>LOGGED BY: <b>CS</b></p> <p>FIGURE NO. <b>1</b></p> </div> |                              |                                                          |                                               |                                                                                                                |                                 |                                                                                      |

| SHEET:<br>1 of 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | LOCATION:<br>See Plan | PROJECT:<br><b>Cowm Top, Castleton</b>                   | ENGINEER:<br><b>CS</b>                        | JOB NO.<br><b>R2228</b>                                                                                                               | TRIAL PIT<br>NO.<br><b>TP05</b> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------------------------------------------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                       | EXCAVATED BY:<br><b>Yanmar 8T tracked midi excavator</b> | CLIENT:<br><b>GLP Ltd &amp; Barratt Homes</b> | DATE:<br><b>28-30 June 2016</b>                                                                                                       |                                 |
| DEPTH<br>(m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | SAMPLES               | Lab testing                                              | DEPTH<br>(m)                                  | DESCRIPTION OF STRATA                                                                                                                 | LEGEND                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | D                     |                                                          | 0                                             | Very soft blackish dark grey clayey TOPSOIL with rootlets.                                                                            |                                 |
| 0.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                       |                                                          | 0.4                                           | Very soft light grey weathered orangish brown slightly gravelly sandy CLAY. Gravel is fine to coarse subrounded sandstone (ALLUVIUM). |                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                       |                                                          | 1.2                                           | Light brown locally slightly cemented fine SAND (HUMMOCKY GLACIAL DEPOSITS).                                                          |                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                       |                                                          |                                               | Excavation finished at 2.6m due to sidewalls collapse.                                                                                |                                 |
| <div style="display: flex;"> <div style="flex: 1;"> <br/>           Smith Grant LLP<br/>           Station House, Station Road,<br/>           Ruabon, Wrexham LL146DL<br/>           Tel: 01978822367<br/>           Fax: 019788247182<br/> <a href="http://www.smithgrant.co.uk">www.smithgrant.co.uk</a><br/>           email: consult@smithgrant.co.uk         </div> <div style="flex: 2;"> <p><b>GROUND WATER:</b><br/>Groundwater inflow between 0.6m and 1.3m. Groundwater at 2.4m after 10min.</p> <p><b>REMARKS:</b><br/>Sidewalls collapsing below 0.6m.</p> <p style="text-align: right;">J: jar sample<br/>D: small disturbed sample<br/>B: bulk disturbed sample</p> </div> </div> |                       |                                                          |                                               |                                                                                                                                       |                                 |
| SCALE:<br><b>1:250</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                       | LOGGED BY:<br><b>CS</b>                                  |                                               | FIGURE NO.<br><b>1</b>                                                                                                                |                                 |

| SHEET:<br><b>1 of 1</b>                                                                                                                                                                                                                                                               | LOCATION:<br><b>See Plan</b> | PROJECT:<br><b>Cowm Top, Castleton</b>                                          | ENGINEER:<br><b>CS</b>                        |                                                                                                                                                                                                 | JOB NO.<br><b>R2228</b>         | TRIAL PIT NO.<br><b>TP06</b>                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------------------------------------------------------------------------|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                       |                              | EXCAVATED BY:<br><b>Yanmar 8T tracked midi excavator</b>                        | CLIENT:<br><b>GLP Ltd &amp; Barratt Homes</b> |                                                                                                                                                                                                 | DATE:<br><b>28-30 June 2016</b> |                                                                                      |
| DEPTH<br>(m)                                                                                                                                                                                                                                                                          | SAMPLES                      | Lab testing                                                                     | DEPTH<br>(m)                                  | DESCRIPTION OF STRATA                                                                                                                                                                           |                                 | LEGEND                                                                               |
| 0.1                                                                                                                                                                                                                                                                                   | J1                           |                                                                                 | 0                                             | Blackish dark grey sandy clayey TOPSOIL with rootlets.                                                                                                                                          |                                 |   |
|                                                                                                                                                                                                                                                                                       |                              |                                                                                 | 0.4                                           | Firm becoming stiff light grey weathered orangish brown slightly gravelly slightly sandy CLAY with partings of sand. Gravel is fine to coarse subangular sandstone (HUMMOCKY GLACIAL DEPOSITS). |                                 |   |
| 1.1                                                                                                                                                                                                                                                                                   | B                            |                                                                                 | 1.3                                           | Stiff light grey slightly gravelly slightly sandy CLAY. Gravel is fine to coarse subangular sandstone, occasionally coal (HUMMOCKY GLACIAL DEPOSITS).                                           |                                 |  |
|                                                                                                                                                                                                                                                                                       |                              |                                                                                 |                                               | Difficult excavation at 2.5m due to clay stiffness. Finished at 2.5m.                                                                                                                           |                                 |                                                                                      |
|  <p>Smith Grant LLP<br/>Station House, Station Road,<br/>Ruabon, Wrexham LL146DL</p> <p>Tel: 01978822367<br/>Fax: 019788247182</p> <p>www.smithgrant.co.uk<br/>email: consult@smithgrant.co.uk</p> |                              | GROUND WATER:<br>No groundwater encountered                                     |                                               |                                                                                                                                                                                                 |                                 |                                                                                      |
|                                                                                                                                                                                                                                                                                       |                              | REMARKS:<br>Sidewalls stable                                                    |                                               |                                                                                                                                                                                                 |                                 |                                                                                      |
|                                                                                                                                                                                                                                                                                       |                              | <p>J: jar sample<br/>D: small disturbed sample<br/>B: bulk disturbed sample</p> |                                               |                                                                                                                                                                                                 |                                 |                                                                                      |
| SCALE:<br><b>1:250</b>                                                                                                                                                                                                                                                                |                              | LOGGED BY:<br><b>CS</b>                                                         |                                               | FIGURE NO.<br><b>1</b>                                                                                                                                                                          |                                 |                                                                                      |

| SHEET:<br><b>1 of 1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | LOCATION:<br><b>See Plan</b> | PROJECT:<br><b>Cowm Top, Castleton</b>                   | ENGINEER:<br><b>CS</b>                        |                                                                                                                                                                                                            | JOB NO.<br><b>R2228</b>         | TRIAL PIT NO.<br><b>TP07</b>                                                         |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              | EXCAVATED BY:<br><b>Yanmar 8T tracked midi excavator</b> | CLIENT:<br><b>GLP Ltd &amp; Barratt Homes</b> |                                                                                                                                                                                                            | DATE:<br><b>28-30 June 2016</b> |                                                                                      |
| DEPTH<br>(m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | SAMPLES                      | Lab testing                                              | DEPTH<br>(m)                                  | DESCRIPTION OF STRATA                                                                                                                                                                                      |                                 | LEGEND                                                                               |
| 0.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | J1                           |                                                          | 0                                             | Blackish dark grey slightly clayey sandy TOPSOIL with rootlets.                                                                                                                                            |                                 |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | D                            |                                                          | 0.3                                           | Light grey weathered reddish brown slightly gravelly slightly clayey fine SAND with lenses of brown locally stained black clay. Gravel is fine to coarse subrounded sandstone (HUMMOCKY GLACIAL DEPOSITS). |                                 |   |
| 0.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                              |                                                          | 1                                             | Firm reddish brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse subrounded sandstone (HUMMOCKY GLACIAL DEPOSITS).                                                                       |                                 |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              |                                                          |                                               | Base of excavation at 3m.                                                                                                                                                                                  |                                 |                                                                                      |
| <div>  <p>SMITH GRANT<br/>Environmental Consultancy<br/>LLP</p> <p>Smith Grant LLP<br/>Station House, Station Road,<br/>Ruabon, Wrexham LL146DL</p> <p>Tel: 01978822367<br/>Fax: 019788247182</p> <p>www.smithgrant.co.uk<br/>email: consult@smithgrant.co.uk</p> </div> <div> <p><b>GROUND WATER:</b><br/>No groundwater encountered</p> <p><b>REMARKS:</b><br/>Sidewalls stable</p> <p>J: jar sample<br/>D: small disturbed sample<br/>B: bulk disturbed sample</p> <p>SCALE: <b>1:250</b></p> <p>LOGGED BY: <b>CS</b></p> <p>FIGURE NO. <b>1</b></p> </div> |                              |                                                          |                                               |                                                                                                                                                                                                            |                                 |                                                                                      |

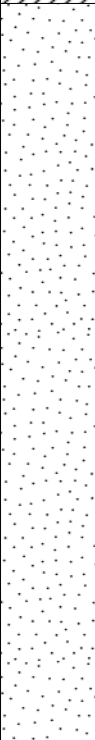
| SHEET:<br><b>1 of 1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | LOCATION:<br><b>See Plan</b> | PROJECT:<br><b>Cowm Top, Castleton</b>                   | ENGINEER:<br><b>CS</b>                        |                                                                                               | JOB NO.<br><b>R2228</b>                                                              | TRIAL PIT<br>NO.<br><b>TP08</b> |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                              | EXCAVATED BY:<br><b>Yanmar 8T tracked midi excavator</b> | CLIENT:<br><b>GLP Ltd &amp; Barratt Homes</b> |                                                                                               | DATE:<br><b>28-30 June 2016</b>                                                      |                                 |
| DEPTH<br>(m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | SAMPLES                      | Lab testing                                              | DEPTH<br>(m)                                  | DESCRIPTION OF STRATA                                                                         | LEGEND                                                                               |                                 |
| 0.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | J1                           |                                                          | 0                                             | MADE GROUND: Brown sand with rags, gravel of brick and wood.                                  |   |                                 |
| 0.7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | D                            |                                                          | 0.6                                           | MADE GROUND: Gravel of slag and brick, bottle glas, nails, iron frames, shoe soles and rags.  |                                                                                      |                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                              |                                                          | 2.2                                           | Very soft to soft light grey laminated yellowish grey slightly gravelly CLAY (POSSIBLE FILL). |  |                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                              |                                                          |                                               | Base of excavation at 3.1m.                                                                   |                                                                                      |                                 |
| <div>  <p>Smith Grant LLP<br/>Station House, Station Road,<br/>Ruabon, Wrexham LL146DL<br/>Tel: 01978822367<br/>Fax: 019788247182<br/>www.smithgrant.co.uk<br/>email: consult@smithgrant.co.uk</p> </div> <div> <p><b>GROUND WATER:</b><br/>No groundwater encountered</p> <p><b>REMARKS:</b><br/>Sidewalls unstable within Made Ground</p> <p>J: jar sample<br/>D: small disturbed sample<br/>B: bulk disturbed sample</p> </div> <div> <p>SCALE: <b>1:250</b></p> <p>LOGGED BY: <b>CS</b></p> <p>FIGURE NO. <b>1</b></p> </div> |                              |                                                          |                                               |                                                                                               |                                                                                      |                                 |

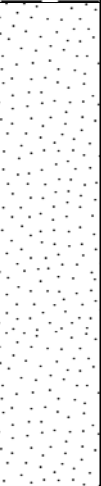


| SHEET:<br><b>1 of 1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | LOCATION:<br><b>See Plan</b> | PROJECT:<br><b>Cowm Top, Castleton</b>                   | ENGINEER:<br><b>CS</b>                        |                                                                                                                             | JOB NO.<br><b>R2228</b>         | TRIAL PIT<br>NO.<br><b>TP09</b>                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                              | EXCAVATED BY:<br><b>Yanmar 8T tracked midi excavator</b> | CLIENT:<br><b>GLP Ltd &amp; Barratt Homes</b> |                                                                                                                             | DATE:<br><b>28-30 June 2016</b> |                                                                                      |
| DEPTH<br>(m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | SAMPLES                      | Lab testing                                              | DEPTH<br>(m)                                  | DESCRIPTION OF STRATA                                                                                                       |                                 | LEGEND                                                                               |
| 0.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | B                            |                                                          | 0                                             | Blackish dark grey slightly clayey slightly gravelly sandy TOPSOIL.                                                         |                                 |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                              |                                                          | 0.3                                           | Light brown sandy GRAVEL. Gravel is fine to coarse subrounded sandstone and limestone (HUMMOCKY GLACIAL DEPOSIT).           |                                 |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                              |                                                          | 1.1                                           | Light brown slightly gravelly SAND. Gravel is fine to coarse subrounded sandstone and limestone (HUMMOCKY GLACIAL DEPOSIT). |                                 |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                              |                                                          |                                               | Base of excavation at 2.8m.                                                                                                 |                                 |                                                                                      |
| <div style="display: flex; justify-content: space-between;"> <div style="width: 25%;">  <p>Smith Grant LLP<br/>Station House, Station Road,<br/>Ruabon, Wrexham LL146DL</p> <p>Tel: 01978822367<br/>Fax: 019788247182</p> <p>www.smithgrant.co.uk<br/>email: consult@smithgrant.co.uk</p> </div> <div style="width: 75%;"> <p><b>GROUND WATER:</b><br/>Seepage in sand at 2.7m.</p> <p><b>REMARKS:</b><br/>Sidewalls stable</p> <p style="text-align: right;">J: jar sample<br/>D: small disturbed sample<br/>B: bulk disturbed sample</p> </div> </div> |                              |                                                          |                                               |                                                                                                                             |                                 |                                                                                      |
| SCALE:<br><b>1:250</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                              |                                                          | LOGGED BY:<br><b>CS</b>                       |                                                                                                                             | FIGURE NO.<br><b>1</b>          |                                                                                      |

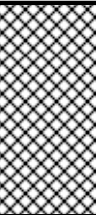
|                                                                                                                                                                                                                                                                                       |                              |                                                          |                                               |                                                                                                                             |                                 |                                                                                      |
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| SHEET:<br><b>1 of 1</b>                                                                                                                                                                                                                                                               | LOCATION:<br><b>See Plan</b> | PROJECT:<br><b>Cowm Top, Castleton</b>                   | ENGINEER:<br><b>CS</b>                        |                                                                                                                             | JOB NO.<br><b>R2228</b>         | TRIAL PIT<br>NO.<br><b>TP10</b>                                                      |
|                                                                                                                                                                                                                                                                                       |                              | EXCAVATED BY:<br><b>Yanmar 8T tracked midi excavator</b> | CLIENT:<br><b>GLP Ltd &amp; Barratt Homes</b> |                                                                                                                             | DATE:<br><b>28-30 June 2016</b> |                                                                                      |
| DEPTH<br>(m)                                                                                                                                                                                                                                                                          | SAMPLES                      | Lab testing                                              | DEPTH<br>(m)                                  | DESCRIPTION OF STRATA                                                                                                       |                                 | LEGEND                                                                               |
| 1.3                                                                                                                                                                                                                                                                                   | B                            |                                                          | 0                                             | Very soft blackish dark grey clayey TOPSOIL.                                                                                |                                 |   |
|                                                                                                                                                                                                                                                                                       |                              |                                                          | 0.7                                           | Light brown slightly gravelly SAND. Gravel is fine to coarse subangular to subrounded sandstone (HUMMOCKY GLACIAL DEPOSIT). |                                 |   |
|                                                                                                                                                                                                                                                                                       |                              |                                                          | 1.7                                           | Orangish light brown locally stained black fine SAND (HUMMOCKY GLACIAL DEPOSIT).                                            |                                 |  |
|                                                                                                                                                                                                                                                                                       |                              |                                                          |                                               | Base of excavation at 3.2m.                                                                                                 |                                 |                                                                                      |
|  <p>Smith Grant LLP<br/>Station House, Station Road,<br/>Ruabon, Wrexham LL146DL</p> <p>Tel: 01978822367<br/>Fax: 019788247182</p> <p>www.smithgrant.co.uk<br/>email: consult@smithgrant.co.uk</p> |                              | <b>GROUND WATER:</b><br>Seepage from 2m.                 |                                               |                                                                                                                             |                                 |                                                                                      |
|                                                                                                                                                                                                                                                                                       |                              | <b>REMARKS:</b><br>Sidewalls collapsing from 0.3m.       |                                               |                                                                                                                             |                                 |                                                                                      |
|                                                                                                                                                                                                                                                                                       |                              | SCALE:<br><b>1:250</b>                                   |                                               | LOGGED BY:<br><b>CS</b>                                                                                                     |                                 | FIGURE NO.<br><b>1</b>                                                               |

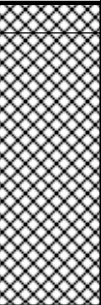
J: jar sample  
D: small disturbed sample  
B: bulk disturbed sample

|                                                                                                                                                                                                                                                                                       |                              |                                                                                                                                                                                        |                                               |                                                                                                                             |                                                                                      |
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| SHEET:<br><b>1 of 1</b>                                                                                                                                                                                                                                                               | LOCATION:<br><b>See Plan</b> | PROJECT:<br><b>Cowm Top, Castleton</b>                                                                                                                                                 | ENGINEER:<br><b>CS</b>                        | JOB NO.<br><b>R2228</b>                                                                                                     | TRIAL PIT NO.<br><b>TP11</b>                                                         |
|                                                                                                                                                                                                                                                                                       |                              | EXCAVATED BY:<br><b>Yanmar 8T tracked midi excavator</b>                                                                                                                               | CLIENT:<br><b>GLP Ltd &amp; Barratt Homes</b> | DATE:<br><b>28-30 June 2016</b>                                                                                             |                                                                                      |
| DEPTH (m)                                                                                                                                                                                                                                                                             | SAMPLES                      | Lab testing                                                                                                                                                                            | DEPTH (m)                                     | DESCRIPTION OF STRATA                                                                                                       | LEGEND                                                                               |
| 0.1                                                                                                                                                                                                                                                                                   | J1                           |                                                                                                                                                                                        | 0                                             | Black slightly clayey sandy TOPSOIL with rootlets.                                                                          |   |
|                                                                                                                                                                                                                                                                                       |                              |                                                                                                                                                                                        | 0.25                                          | Light brown slightly gravelly SAND. Gravel is fine to coarse subangular to subrounded sandstone (HUMMOCKY GLACIAL DEPOSIT). |  |
| 1.6                                                                                                                                                                                                                                                                                   | D                            |                                                                                                                                                                                        |                                               | Base of excavation at 2.7m.                                                                                                 |                                                                                      |
|                                                                                                                                                                                                                                                                                       |                              |                                                                                                                                                                                        |                                               |                                                                                                                             |                                                                                      |
|  <p>Smith Grant LLP<br/>Station House, Station Road,<br/>Ruabon, Wrexham LL146DL</p> <p>Tel: 01978822367<br/>Fax: 019788247182</p> <p>www.smithgrant.co.uk<br/>email: consult@smithgrant.co.uk</p> |                              | <p><b>GROUND WATER:</b><br/>No groundwater encountered</p> <p><b>REMARKS:</b><br/>Sidewalls stable</p> <p>J: jar sample<br/>D: small disturbed sample<br/>B: bulk disturbed sample</p> |                                               |                                                                                                                             |                                                                                      |
| SCALE:<br><b>1:250</b>                                                                                                                                                                                                                                                                |                              | LOGGED BY:<br><b>CS</b>                                                                                                                                                                |                                               | FIGURE NO.<br><b>1</b>                                                                                                      |                                                                                      |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                              |                                                          |                                               |                                                                                                                                  |                                 |                                                                                      |
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| SHEET:<br><b>1 of 1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | LOCATION:<br><b>See Plan</b> | PROJECT:<br><b>Cowm Top, Castleton</b>                   | ENGINEER:<br><b>CS</b>                        |                                                                                                                                  | JOB NO.<br><b>R2228</b>         | TRIAL PIT<br>NO.<br><b>TP12</b>                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                              | EXCAVATED BY:<br><b>Yanmar 8T tracked midi excavator</b> | CLIENT:<br><b>GLP Ltd &amp; Barratt Homes</b> |                                                                                                                                  | DATE:<br><b>28-30 June 2016</b> |                                                                                      |
| DEPTH<br>(m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | SAMPLES                      | Lab testing                                              | DEPTH<br>(m)                                  | DESCRIPTION OF STRATA                                                                                                            |                                 | LEGEND                                                                               |
| 0.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | D                            |                                                          | 0                                             | Blackish dark grey sandy clayey TOPSOIL with rootlets.                                                                           |                                 |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                              |                                                          | 0.4                                           | Soft becoming firm light grey weathered brown sandy CLAY with partings of sand and occasional gravel (HUMMOCKY GLACIAL DEPOSIT). |                                 |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                              |                                                          | 1.1                                           | Light brown locally stained black SAND (HUMMOCKY GLACIAL DEPOSIT).                                                               |                                 |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                              |                                                          |                                               | Base of excavation at 2.7m.                                                                                                      |                                 |                                                                                      |
| <div>  <p>Smith Grant LLP<br/>Station House, Station Road,<br/>Ruabon, Wrexham LL146DL<br/>Tel: 01978822367<br/>Fax: 019788247182<br/>www.smithgrant.co.uk<br/>email: consult@smithgrant.co.uk</p> </div> <div> <p><b>GROUND WATER:</b><br/>No groundwater encountered</p> <p><b>REMARKS:</b><br/>Sidewalls stable</p> <p>J: jar sample<br/>D: small disturbed sample<br/>B: bulk disturbed sample</p> </div> <div> <p>SCALE: <b>1:250</b></p> <p>LOGGED BY: <b>CS</b></p> <p>FIGURE NO. <b>1</b></p> </div> |                              |                                                          |                                               |                                                                                                                                  |                                 |                                                                                      |

| SHEET:<br><b>1 of 1</b>                                                                                                                                                            | LOCATION:<br><b>See Plan</b> | PROJECT:<br><b>Cowm Top, Castleton</b>                       | ENGINEER:<br><b>CS</b>                        |                                                                                                       | JOB NO.<br><b>R2228</b>         | TRIAL PIT<br>NO.<br><b>TP13</b> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--------------------------------------------------------------|-----------------------------------------------|-------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------|
|                                                                                                                                                                                    |                              | EXCAVATED BY:<br><b>Yanmar 8T tracked midi excavator</b>     | CLIENT:<br><b>GLP Ltd &amp; Barratt Homes</b> |                                                                                                       | DATE:<br><b>28-30 June 2016</b> |                                 |
| DEPTH<br>(m)                                                                                                                                                                       | SAMPLES                      | Lab testing                                                  | DEPTH<br>(m)                                  | DESCRIPTION OF STRATA                                                                                 |                                 | LEGEND                          |
| 0                                                                                                                                                                                  | J1                           |                                                              | 0                                             | MADE GROUND: Black slightly clayey sandy TOPSOIL with rootlets.                                       |                                 |                                 |
| 0.3                                                                                                                                                                                |                              |                                                              | 0.1                                           | MADE GROUND: Greyish brown slightly sandy slightly gravelly CLAY. Gravel is angular brick.            |                                 |                                 |
|                                                                                                                                                                                    | D                            |                                                              |                                               |                                                                                                       |                                 |                                 |
|                                                                                                                                                                                    |                              |                                                              |                                               |                                                                                                       |                                 |                                 |
|                                                                                                                                                                                    |                              |                                                              | 1.8                                           | Very soft grey slightly gravelly CLAY. Gravel is fine to coarse subrounded sandstone (POSSIBLE FILL). |                                 |                                 |
|                                                                                                                                                                                    |                              |                                                              |                                               |                                                                                                       |                                 |                                 |
| 3                                                                                                                                                                                  |                              |                                                              |                                               | Base of excavation at 3.4m.                                                                           |                                 |                                 |
|                                                                                                                                                                                    |                              |                                                              |                                               |                                                                                                       |                                 |                                 |
| <br>Smith Grant LLP<br>Station House, Station Road,<br>Ruabon, Wrexham LL146DL<br>Tel: 01978822367<br>Fax: 019788247182<br>www.smithgrant.co.uk<br>email: consult@smithgrant.co.uk |                              | GROUND WATER:<br>No groundwater encountered                  |                                               |                                                                                                       |                                 |                                 |
|                                                                                                                                                                                    |                              | REMARKS:<br>Sidewalls stable                                 |                                               |                                                                                                       |                                 |                                 |
|                                                                                                                                                                                    |                              | SCALE: <b>1:250</b> LOGGED BY: <b>CS</b> FIGURE NO. <b>1</b> |                                               |                                                                                                       |                                 |                                 |
| J: jar sample<br>D: small disturbed sample<br>B: bulk disturbed sample                                                                                                             |                              |                                                              |                                               |                                                                                                       |                                 |                                 |

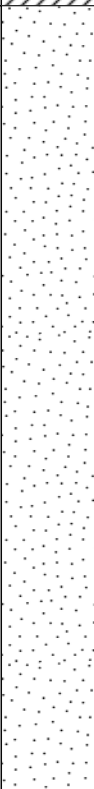
| SHEET:<br><b>1 of 1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | LOCATION:<br><b>See Plan</b> | PROJECT:<br><b>Cowm Top, Castleton</b>                   | ENGINEER:<br><b>CS</b>                        |                                                                                                            | JOB NO.<br><b>R2228</b>         | TRIAL PIT<br>NO.<br><b>TP14</b>                                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                              | EXCAVATED BY:<br><b>Yanmar 8T tracked midi excavator</b> | CLIENT:<br><b>GLP Ltd &amp; Barratt Homes</b> |                                                                                                            | DATE:<br><b>28-30 June 2016</b> |                                                                                      |
| DEPTH<br>(m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | SAMPLES                      | Lab testing                                              | DEPTH<br>(m)                                  | DESCRIPTION OF STRATA                                                                                      |                                 | LEGEND                                                                               |
| 1.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | B                            |                                                          | 0                                             | MADE GROUND: Blackish dark grey slightly gravelly TOPSOIL. Gravel is sandstone and ceramic.                |                                 |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                              |                                                          | 0.7                                           | Reddish brown locally stained black SAND (HUMMOCKY GLACIAL DEPOSIT).                                       |                                 |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                              |                                                          | 1.6                                           | Light brown sandy fine to coarse subrounded GRAVEL of sandstone with boulders ((HUMMOCKY GLACIAL DEPOSIT). |                                 |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                              |                                                          | 2.1                                           | Brown fine SAND (HUMMOCKY GLACIAL DEPOSIT).                                                                |                                 |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                              |                                                          |                                               | Base of excavation at 3m.                                                                                  |                                 |                                                                                      |
| <div>  <p>SMITH GRANT<br/>Environmental<br/>Consultancy<br/>LLP</p> <p>Smith Grant LLP<br/>Station House, Station Road,<br/>Ruabon, Wrexham LL146DL</p> <p>Tel: 01978822367<br/>Fax: 019788247182</p> <p>www.smithgrant.co.uk<br/>email: consult@smithgrant.co.uk</p> </div> <div> <p><b>GROUND WATER:</b><br/>No groundwater encountered</p> <p><b>REMARKS:</b><br/>Sidewalls stable</p> <p>SCALE: <b>1:250</b></p> <p>LOGGED BY: <b>CS</b></p> <p>FIGURE NO. <b>1</b></p> <p>J: jar sample<br/>D: small disturbed sample<br/>B: bulk disturbed sample</p> </div> |                              |                                                          |                                               |                                                                                                            |                                 |                                                                                      |

| SHEET:<br><b>1 of 1</b>                                                                                                                                                                                                                                                                                                                                     | LOCATION:<br><b>See Plan</b> | PROJECT:<br><b>Cowm Top, Castleton</b>                   | ENGINEER:<br><b>CS</b>                        |                                                                                                                                                                                                                          | JOB NO.<br><b>R2228</b>                                                              | TRIAL PIT NO.<br><b>TP15</b> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------------|
|                                                                                                                                                                                                                                                                                                                                                             |                              | EXCAVATED BY:<br><b>Yanmar 8T tracked midi excavator</b> | CLIENT:<br><b>GLP Ltd &amp; Barratt Homes</b> |                                                                                                                                                                                                                          | DATE:<br><b>28-30 June 2016</b>                                                      |                              |
| DEPTH (m)                                                                                                                                                                                                                                                                                                                                                   | SAMPLES                      | Lab testing                                              | DEPTH (m)                                     | DESCRIPTION OF STRATA                                                                                                                                                                                                    | LEGEND                                                                               |                              |
| 0                                                                                                                                                                                                                                                                                                                                                           | J1                           |                                                          | 0                                             | MADE GROUND: Blackish dark grey slightly gravelly TOPSOIL. Gravel is fine to medium subangular sandstone.<br>MADE GROUND: Blackish dark brown slightly gravelly CLAY. Gravel is brick, ceramic and bits of decayed wood. |   |                              |
| 0.3                                                                                                                                                                                                                                                                                                                                                         |                              |                                                          | 0.1                                           |                                                                                                                                                                                                                          |                                                                                      |                              |
| 1.3                                                                                                                                                                                                                                                                                                                                                         | D                            |                                                          | 1                                             | Light brown slightly clayey gravelly SAND. Gravel is fine to coarse subrounded sandstone (HUMMOCKY GLACIAL DEPOSIT).                                                                                                     |  |                              |
|                                                                                                                                                                                                                                                                                                                                                             |                              |                                                          | Base of excavation at 2.8m.                   |                                                                                                                                                                                                                          |                                                                                      |                              |
| <div>  <p>SMITH GRANT<br/>Environmental Consultancy<br/>LLP</p> <p>Smith Grant LLP<br/>Station House, Station Road,<br/>Ruabon, Wrexham LL146DL</p> <p>Tel: 01978822367<br/>Fax: 019788247182</p> <p>www.smithgrant.co.uk<br/>email: consult@smithgrant.co.uk</p> </div> |                              |                                                          |                                               |                                                                                                                                                                                                                          |                                                                                      |                              |
| <div> <p><b>GROUND WATER:</b><br/>No groundwater encountered</p> <p><b>REMARKS:</b><br/>Sidewalls stable</p> <p>J: jar sample<br/>D: small disturbed sample<br/>B: bulk disturbed sample</p> </div>                                                                                                                                                         |                              |                                                          |                                               |                                                                                                                                                                                                                          |                                                                                      |                              |
| SCALE:<br><b>1:250</b>                                                                                                                                                                                                                                                                                                                                      |                              |                                                          | LOGGED BY:<br><b>CS</b>                       |                                                                                                                                                                                                                          | FIGURE NO.<br><b>1</b>                                                               |                              |

|                                                                                                                                                                                                                                                                                       |                              |                                                                  |                                               |                                                                                                                                         |                                 |                                                                                      |
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| SHEET:<br><b>1 of 1</b>                                                                                                                                                                                                                                                               | LOCATION:<br><b>See Plan</b> | PROJECT:<br><b>Cowm Top, Castleton</b>                           | ENGINEER:<br><b>CS</b>                        |                                                                                                                                         | JOB NO.<br><b>R2228</b>         | TRIAL PIT<br>NO.<br><b>TP16</b>                                                      |
|                                                                                                                                                                                                                                                                                       |                              | EXCAVATED BY:<br><b>Yanmar 8T tracked midi excavator</b>         | CLIENT:<br><b>GLP Ltd &amp; Barratt Homes</b> |                                                                                                                                         | DATE:<br><b>28-30 June 2016</b> |                                                                                      |
| DEPTH<br>(m)                                                                                                                                                                                                                                                                          | SAMPLES                      | Lab testing                                                      | DEPTH<br>(m)                                  | DESCRIPTION OF STRATA                                                                                                                   |                                 | LEGEND                                                                               |
| 1                                                                                                                                                                                                                                                                                     | B                            |                                                                  | 0                                             | Black slightly clayey sandy TOPSOIL with rootlets.                                                                                      |                                 |   |
|                                                                                                                                                                                                                                                                                       |                              |                                                                  | 0.4                                           | Light grey slightly gravelly SAND with lenses of clayey sand. Gravel is fine to coarse subrounded sandstone (HUMMOCKY GLACIAL DEPOSIT). |                                 |   |
|                                                                                                                                                                                                                                                                                       |                              |                                                                  | 1.6                                           | Light brown SAND with lenses of firm orangish brown clay (HUMMOCKY GLACIAL DEPOSIT).                                                    |                                 |  |
|                                                                                                                                                                                                                                                                                       |                              |                                                                  |                                               | Base of excavation at 3m.                                                                                                               |                                 |                                                                                      |
|  <p>Smith Grant LLP<br/>Station House, Station Road,<br/>Ruabon, Wrexham LL146DL</p> <p>Tel: 01978822367<br/>Fax: 019788247182</p> <p>www.smithgrant.co.uk<br/>email: consult@smithgrant.co.uk</p> |                              | <b>GROUND WATER:</b><br>Seepages observed at 0.8m, 1.3m and 1.8m |                                               |                                                                                                                                         |                                 |                                                                                      |
|                                                                                                                                                                                                                                                                                       |                              | <b>REMARKS:</b><br>Sidewalls unstable because of seepage         |                                               |                                                                                                                                         |                                 |                                                                                      |
|                                                                                                                                                                                                                                                                                       |                              | SCALE:<br><b>1:250</b>                                           | LOGGED BY:<br><b>CS</b>                       |                                                                                                                                         | FIGURE NO.<br><b>1</b>          |                                                                                      |

J: jar sample  
D: small disturbed sample  
B: bulk disturbed sample



|                         |                              |                                                          |                                               |                                                                                                   |                                                                                      |
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| SHEET:<br><b>1 of 1</b> | LOCATION:<br><b>See Plan</b> | PROJECT:<br><b>Cowm Top, Castleton</b>                   | ENGINEER:<br><b>CS</b>                        | JOB NO.<br><b>R2228</b>                                                                           | TRIAL PIT NO.<br><b>TP17</b>                                                         |
|                         |                              | EXCAVATED BY:<br><b>Yanmar 8T tracked midi excavator</b> | CLIENT:<br><b>GLP Ltd &amp; Barratt Homes</b> | DATE:<br><b>28-30 June 2016</b>                                                                   |                                                                                      |
| DEPTH (m)               | SAMPLES                      | Lab testing                                              | DEPTH (m)                                     | DESCRIPTION OF STRATA                                                                             | LEGEND                                                                               |
| 0.1                     | J1                           |                                                          | 0                                             | Blackish dark grey slightly clayey sandy TOPSOIL                                                  |   |
|                         |                              |                                                          | 0.4                                           | Light brown locally stained dark brown locally slightly cemented SAND (HUMMOCKY GLACIAL DEPOSIT). |  |
| 1.1                     | D                            |                                                          |                                               | Base of excavation at 3m.                                                                         |                                                                                      |
|                         |                              |                                                          |                                               |                                                                                                   |                                                                                      |



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 Station House, Station Road,  
 Ruabon, Wrexham LL146DL  
 Tel: 01978822367  
 Fax: 019788247182  
 www.smithgrant.co.uk  
 email: consult@smithgrant.co.uk

**GROUND WATER:**  
No groundwater encountered

**REMARKS:**  
Sidewalls stable

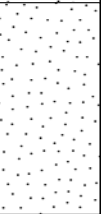
J: jar sample  
 D: small disturbed sample  
 B: bulk disturbed sample

SCALE: **1:250**

LOGGED BY: **CS**

FIGURE NO. **1**

| SHEET:<br><b>1 of 1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | LOCATION:<br><b>See Plan</b> | PROJECT:<br><b>Cowm Top, Castleton</b>                   | ENGINEER:<br><b>CS</b>                        |                                                                                                                                   | JOB NO.<br><b>R2228</b>         | TRIAL PIT<br>NO.<br><b>TP18</b>                                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              | EXCAVATED BY:<br><b>Yanmar 8T tracked midi excavator</b> | CLIENT:<br><b>GLP Ltd &amp; Barratt Homes</b> |                                                                                                                                   | DATE:<br><b>28-30 June 2016</b> |                                                                                      |
| DEPTH<br>(m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | SAMPLES                      | Lab testing                                              | DEPTH<br>(m)                                  | DESCRIPTION OF STRATA                                                                                                             |                                 | LEGEND                                                                               |
| 0.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | J1                           |                                                          | 0                                             | Blackish dark grey slightly clayey sandy TOPSOIL with tree roots and rootlets.                                                    |                                 |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              |                                                          | 0.3                                           | Light brown gravelly SAND with partings of clayey sand. Gravel is fine to coarse subrounded sandstone (HUMMOCKY GLACIAL DEPOSIT). |                                 |   |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | B                            |                                                          | 1.5                                           | Stiff light brown to light grey CLAY (HUMMOCKY GLACIAL DEPOSIT).                                                                  |                                 |  |
| 2.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | B                            |                                                          |                                               | Base of excavation at 2.8m.                                                                                                       |                                 |                                                                                      |
| <div>  <p> <b>SMITH GRANT</b><br/> <i>Environmental Consultancy</i><br/> <b>LLP</b> </p> <p>           Smith Grant LLP<br/>           Station House, Station Road,<br/>           Ruabon, Wrexham LL146DL<br/>           Tel: 01978822367<br/>           Fax: 019788247182<br/>           www.smithgrant.co.uk<br/>           email: consult@smithgrant.co.uk         </p> </div> <div> <p><b>GROUND WATER:</b><br/>No groundwater encountered</p> <p><b>REMARKS:</b><br/>Sidewalls stable</p> <p>           J: jar sample<br/>           D: small disturbed sample<br/>           B: bulk disturbed sample         </p> </div> <div> <p>SCALE: <b>1:250</b></p> <p>LOGGED BY: <b>CS</b></p> <p>FIGURE NO. <b>1</b></p> </div> |                              |                                                          |                                               |                                                                                                                                   |                                 |                                                                                      |

| SHEET:<br><b>1 of 1</b>                                                                                                                                                                                                                                                               | LOCATION:<br><b>See Plan</b> | PROJECT:<br><b>Cowm Top, Castleton</b>                   | ENGINEER:<br><b>CS</b>                             |                                                                                                               | JOB NO.<br><b>R2228</b>         | TRIAL PIT<br>NO.<br><b>TP19</b>                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                       |                              | EXCAVATED BY:<br><b>Yanmar 8T tracked midi excavator</b> | CLIENT:<br><b>GLP Ltd &amp; Barratt Homes</b>      |                                                                                                               | DATE:<br><b>28-30 June 2016</b> |                                                                                       |
| DEPTH<br>(m)                                                                                                                                                                                                                                                                          | SAMPLES                      | Lab testing                                              | DEPTH<br>(m)                                       | DESCRIPTION OF STRATA                                                                                         |                                 | LEGEND                                                                                |
| 1.4                                                                                                                                                                                                                                                                                   | B                            |                                                          | 0                                                  | Dark brown slightly gravelly sandy TOPSOIL with rootlets.                                                     |                                 |    |
|                                                                                                                                                                                                                                                                                       |                              |                                                          | 0.4                                                | Light brown gravelly SAND. Gravel is fine to coarse subrounded sandstone (HUMMOCKY GLACIAL DEPOSIT).          |                                 |   |
|                                                                                                                                                                                                                                                                                       |                              |                                                          | 2.4                                                | Light brown slightly gravelly SAND. Gravel is fine to coarse subrounded sandstone (HUMMOCKY GLACIAL DEPOSIT). |                                 |  |
|                                                                                                                                                                                                                                                                                       |                              |                                                          |                                                    | Base of excavation at 3.1m.                                                                                   |                                 |                                                                                       |
|  <p>Smith Grant LLP<br/>Station House, Station Road,<br/>Ruabon, Wrexham LL146DL</p> <p>Tel: 01978822367<br/>Fax: 019788247182</p> <p>www.smithgrant.co.uk<br/>email: consult@smithgrant.co.uk</p> |                              |                                                          | <b>GROUND WATER:</b><br>No groundwater encountered |                                                                                                               |                                 |                                                                                       |
|                                                                                                                                                                                                                                                                                       |                              |                                                          | <b>REMARKS:</b><br>Sidewalls stable                |                                                                                                               |                                 |                                                                                       |
|                                                                                                                                                                                                                                                                                       |                              |                                                          | SCALE:<br><b>1:250</b>                             | LOGGED BY:<br><b>CS</b>                                                                                       | FIGURE NO.<br><b>1</b>          |                                                                                       |

J: jar sample  
D: small disturbed sample  
B: bulk disturbed sample

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                              |                                                          |                                               |                                                                                                                                        |                                 |                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------|
| SHEET:<br><b>1 of 1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | LOCATION:<br><b>See Plan</b> | PROJECT:<br><b>Cowm Top, Castleton</b>                   | ENGINEER:<br><b>CS</b>                        |                                                                                                                                        | JOB NO.<br><b>R2228</b>         | TRIAL PIT<br>NO.<br><b>TP20</b>                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                              | EXCAVATED BY:<br><b>Yanmar 8T tracked midi excavator</b> | CLIENT:<br><b>GLP Ltd &amp; Barratt Homes</b> |                                                                                                                                        | DATE:<br><b>28-30 June 2016</b> |                                                                                      |
| DEPTH<br>(m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | SAMPLES                      | Lab testing                                              | DEPTH<br>(m)                                  | DESCRIPTION OF STRATA                                                                                                                  |                                 | LEGEND                                                                               |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | D                            |                                                          | 0                                             | Blackish dark brown slightly gravelly sandy TOPSOIL.                                                                                   |                                 |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                              |                                                          | 0.3                                           | Dark brown becoming light brown gravelly SAND. Gravel is fine to coarse subrounded sandstone and limestone (HUMMOCKY GLACIAL DEPOSIT). |                                 |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                              |                                                          |                                               | Base of excavation at 2.9m.                                                                                                            |                                 |                                                                                      |
| <div>  <p>SMITH GRANT<br/>Environmental<br/>Consultancy<br/>LLP</p> <p>Smith Grant LLP<br/>Station House, Station Road,<br/>Ruabon, Wrexham LL146DL</p> <p>Tel: 01978822367<br/>Fax: 019788247182</p> <p>www.smithgrant.co.uk<br/>email: consult@smithgrant.co.uk</p> </div> <div> <p><b>GROUND WATER:</b><br/>No groundwater encountered</p> <p><b>REMARKS:</b><br/>Sidewalls stable</p> <p>J: jar sample<br/>D: small disturbed sample<br/>B: bulk disturbed sample</p> </div> <div> <p>SCALE: <b>1:250</b></p> <p>LOGGED BY: <b>CS</b></p> <p>FIGURE NO. <b>1</b></p> </div> |                              |                                                          |                                               |                                                                                                                                        |                                 |                                                                                      |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                              |                                                          |                                               |                                                                                                                                               |                                 |                                                                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------|
| SHEET:<br><b>1 of 1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | LOCATION:<br><b>See Plan</b> | PROJECT:<br><b>Cowm Top, Castleton</b>                   | ENGINEER:<br><b>CS</b>                        |                                                                                                                                               | JOB NO.<br><b>R2228</b>         | TRIAL PIT<br>NO.<br><b>TP21</b>                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                              | EXCAVATED BY:<br><b>Yanmar 8T tracked midi excavator</b> | CLIENT:<br><b>GLP Ltd &amp; Barratt Homes</b> |                                                                                                                                               | DATE:<br><b>28-30 June 2016</b> |                                                                                      |
| DEPTH<br>(m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | SAMPLES                      | Lab testing                                              | DEPTH<br>(m)                                  | DESCRIPTION OF STRATA                                                                                                                         |                                 | LEGEND                                                                               |
| 1.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | D                            |                                                          | 0                                             | Blackish dark brown slightly gravelly sandy TOPSOIL.                                                                                          |                                 |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                              |                                                          | 0.4                                           | Light brown gravelly becoming slightly gravelly SAND. Gravel is fine to coarse subrounded sandstone and limestone (HUMMOCKY GLACIAL DEPOSIT). |                                 |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                              |                                                          |                                               | Base of excavation at 2.8m.                                                                                                                   |                                 |                                                                                      |
| <div>  <p>Smith Grant LLP<br/>Station House, Station Road,<br/>Ruabon, Wrexham LL146DL<br/>Tel: 01978822367<br/>Fax: 019788247182<br/>www.smithgrant.co.uk<br/>email: consult@smithgrant.co.uk</p> </div> <div> <p><b>GROUND WATER:</b><br/>No groundwater encountered</p> <p><b>REMARKS:</b><br/>Sidewalls stable</p> <p>J: jar sample<br/>D: small disturbed sample<br/>B: bulk disturbed sample</p> </div> <div> <p>SCALE: <b>1:250</b></p> <p>LOGGED BY: <b>CS</b></p> <p>FIGURE NO. <b>1</b></p> </div> |                              |                                                          |                                               |                                                                                                                                               |                                 |                                                                                      |



TP01



TP02





### TP03



### TP04





TP05



TP06





TP07



TP07



TP08



TP08





TP09



TP10





TP11



TP12





TP13



TP14





TP15



TP16





TP17



TP18





TP19

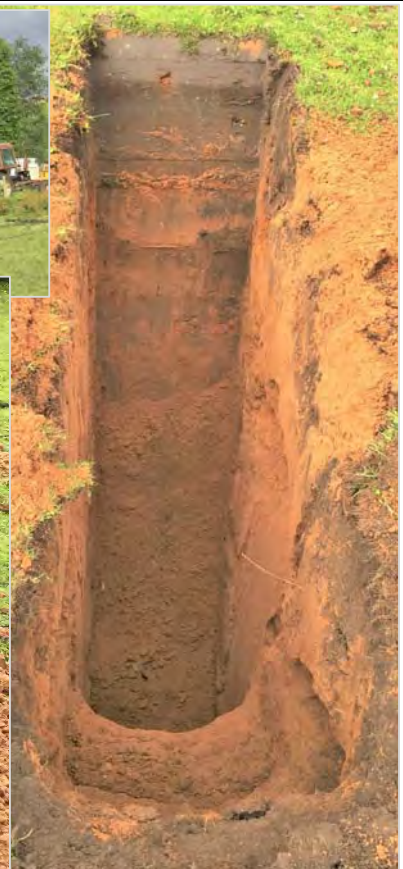


TP20





TP21





## **APPENDIX B**

### **Envirocheck Report**

## Envirocheck<sup>®</sup> Report:

### Datasheet

#### Order Details:

**Order Number:**

77317590\_1\_1

**Customer Reference:**

R2228

**National Grid Reference:**

389200, 410260

**Slice:**

A

**Site Area (Ha):**

21.43

**Search Buffer (m):**

500

#### Site Details:

Site at 389190, 410260

#### Client Details:

Mr S Miller  
Smith Grant Partnership  
Station House  
Station Road  
Ruabon  
Wrexham  
LL14 6DL

| Report Section        | Page Number |
|-----------------------|-------------|
| Summary               | -           |
| Agency & Hydrological | 1           |
| Waste                 | 9           |
| Hazardous Substances  | -           |
| Geological            | 10          |
| Industrial Land Use   | 16          |
| Sensitive Land Use    | 17          |
| Data Currency         | 18          |
| Data Suppliers        | 22          |
| Useful Contacts       | 23          |

#### 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 the attached 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 v50.0

| Data Type                                                     | Page Number | On Site | 0 to 250m | 251 to 500m<br>(*up to 1000m) |
|---------------------------------------------------------------|-------------|---------|-----------|-------------------------------|
| <b>Agency &amp; Hydrological</b>                              |             |         |           |                               |
| Contaminated Land Register Entries and Notices                |             |         |           |                               |
| Discharge Consents                                            |             |         |           |                               |
| Enforcement and Prohibition Notices                           |             |         |           |                               |
| Integrated Pollution Controls                                 | pg 1        |         |           | 2                             |
| Integrated Pollution Prevention And Control                   |             |         |           |                               |
| Local Authority Integrated Pollution Prevention And Control   |             |         |           |                               |
| Local Authority Pollution Prevention and Controls             | pg 1        |         | 3         | 1                             |
| Local Authority Pollution Prevention and Control Enforcements |             |         |           |                               |
| Nearest Surface Water Feature                                 | pg 1        | Yes     |           |                               |
| Pollution Incidents to Controlled Waters                      |             |         |           |                               |
| Prosecutions Relating to Authorised Processes                 |             |         |           |                               |
| Prosecutions Relating to Controlled Waters                    |             |         |           |                               |
| Registered Radioactive Substances                             |             |         |           |                               |
| River Quality                                                 | pg 1        |         |           | 1                             |
| River Quality Biology Sampling Points                         |             |         |           |                               |
| River Quality Chemistry Sampling Points                       |             |         |           |                               |
| Substantiated Pollution Incident Register                     |             |         |           |                               |
| Water Abstractions                                            | pg 2        |         |           | (*3)                          |
| Water Industry Act Referrals                                  |             |         |           |                               |
| Groundwater Vulnerability                                     | pg 2        | Yes     | n/a       | n/a                           |
| Bedrock Aquifer Designations                                  | pg 2        | Yes     | n/a       | n/a                           |
| Superficial Aquifer Designations                              | pg 2        | Yes     | n/a       | n/a                           |
| Source Protection Zones                                       |             |         |           |                               |
| Extreme Flooding from Rivers or Sea without Defences          |             |         |           | n/a                           |
| Flooding from Rivers or Sea without Defences                  |             |         |           | n/a                           |
| Areas Benefiting from Flood Defences                          |             |         |           | n/a                           |
| Flood Water Storage Areas                                     |             |         |           | n/a                           |
| Flood Defences                                                |             |         |           | n/a                           |
| Detailed River Network Lines                                  | pg 3        | Yes     | Yes       | Yes                           |
| Detailed River Network Offline Drainage                       |             |         |           |                               |

| Data Type                                                           | Page Number | On Site | 0 to 250m | 251 to 500m<br>(*up to 1000m) |
|---------------------------------------------------------------------|-------------|---------|-----------|-------------------------------|
| <b>Waste</b>                                                        |             |         |           |                               |
| BGS Recorded Landfill Sites                                         |             |         |           |                               |
| Historical Landfill Sites                                           |             |         |           |                               |
| Integrated Pollution Control Registered Waste Sites                 |             |         |           |                               |
| Licensed Waste Management Facilities (Landfill Boundaries)          |             |         |           |                               |
| Licensed Waste Management Facilities (Locations)                    |             |         |           |                               |
| Local Authority Recorded Landfill Sites                             |             |         |           |                               |
| Registered Landfill Sites                                           |             |         |           |                               |
| Registered Waste Transfer Sites                                     |             |         |           |                               |
| Registered Waste Treatment or Disposal Sites                        |             |         |           |                               |
| <b>Hazardous Substances</b>                                         |             |         |           |                               |
| Control of Major Accident Hazards Sites (COMAH)                     |             |         |           |                               |
| Explosive Sites                                                     |             |         |           |                               |
| Notification of Installations Handling Hazardous Substances (NIHHS) |             |         |           |                               |
| Planning Hazardous Substance Consents                               |             |         |           |                               |
| Planning Hazardous Substance Enforcements                           |             |         |           |                               |
| <b>Geological</b>                                                   |             |         |           |                               |
| BGS 1:625,000 Solid Geology                                         | pg 10       | Yes     | n/a       | n/a                           |
| BGS Estimated Soil Chemistry                                        | pg 10       | Yes     | Yes       | Yes                           |
| BGS Recorded Mineral Sites                                          | pg 13       |         | 3         | 1                             |
| BGS Urban Soil Chemistry                                            |             |         |           |                               |
| BGS Urban Soil Chemistry Averages                                   |             |         |           |                               |
| Brine Compensation Area                                             |             |         | n/a       | n/a                           |
| Coal Mining Affected Areas                                          | pg 14       | Yes     | n/a       | n/a                           |
| Mining Instability                                                  | pg 14       | Yes     | n/a       | n/a                           |
| Man-Made Mining Cavities                                            |             |         |           |                               |
| Natural Cavities                                                    |             |         |           |                               |
| Non Coal Mining Areas of Great Britain                              |             |         |           | n/a                           |
| Potential for Collapsible Ground Stability Hazards                  | pg 14       | Yes     | Yes       | n/a                           |
| Potential for Compressible Ground Stability Hazards                 | pg 14       |         | Yes       | n/a                           |
| Potential for Ground Dissolution Stability Hazards                  |             |         |           | n/a                           |
| Potential for Landslide Ground Stability Hazards                    | pg 14       | Yes     | Yes       | n/a                           |
| Potential for Running Sand Ground Stability Hazards                 | pg 14       | Yes     | Yes       | n/a                           |
| Potential for Shrinking or Swelling Clay Ground Stability Hazards   | pg 14       | Yes     | Yes       | n/a                           |
| Radon Potential - Radon Affected Areas                              |             |         | n/a       | n/a                           |
| Radon Potential - Radon Protection Measures                         |             |         | n/a       | n/a                           |



| Data Type                                  | Page Number | On Site | 0 to 250m | 251 to 500m<br>(*up to 1000m) |
|--------------------------------------------|-------------|---------|-----------|-------------------------------|
| <b>Industrial Land Use</b>                 |             |         |           |                               |
| Contemporary Trade Directory Entries (50m) | pg 16       |         | 4         | n/a                           |
| Fuel Station Entries                       |             |         |           |                               |
| <b>Sensitive Land Use</b>                  |             |         |           |                               |
| Areas of Adopted Green Belt                | pg 17       |         | 1         |                               |
| Areas of Unadopted Green Belt              |             |         |           |                               |
| 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 17       | 1       |           |                               |
| Ramsar Sites                               |             |         |           |                               |
| Sites of Special Scientific Interest       |             |         |           |                               |
| Special Areas of Conservation              |             |         |           |                               |
| Special Protection Areas                   |             |         |           |                               |

| Map ID | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
| 1      | <b>Integrated Pollution Controls</b><br>Name: Dale Joinery Ltd<br>Location: Queensway, ROCHDALE, Lancashire, OL11 2PR<br>Authority: Environment Agency, North West Region<br>Permit Reference: AV5071<br>Dated: 2nd December 1996<br>Process Type: IPC new application<br>Description: 6.7 A (A) Timber processes within Miscellaneous Industries<br><b>Status: Authorisation superseded by a substantial or non substantial variationSuperseded</b><br>Positional Accuracy: Unknown                                                | A10NW (NW)                             | 431                          | 2       | 388705 410800 |
| 1      | <b>Integrated Pollution Controls</b><br>Name: Dale Joinery Ltd<br>Location: Queensway, ROCHDALE, Greater Manchester, OL11 2PR<br>Authority: Environment Agency, North West Region<br>Permit Reference: BD5771<br>Dated: 24th November 1998<br>Process Type: IPC minor (non-substantial) variation to previous variation<br>Description: 6.7 A (A) Timber processes within Miscellaneous Industries<br><b>Status: Authorisation revokedRevoked</b><br>Positional Accuracy: Unknown                                                   | A10NW (NW)                             | 435                          | 2       | 388700 410800 |
| 2      | <b>Local Authority Pollution Prevention and Controls</b><br>Name: Lew Diecasting Ltd<br>Location: Trows Lane, Castleton, ROCHDALE, Lancashire, OL11 2UF<br>Authority: Rochdale Metropolitan Borough Council, Environmental Health Department<br>Permit Reference: 37/05<br>Dated: Not Supplied<br>Process Type: Local Authority Air Pollution Control<br>Description: PG2/4 Iron, steel and non-ferrous metal foundry processes<br><b>Status: Authorised</b><br>Positional Accuracy: Manually positioned to the address or location | A6NW (SW)                              | 52                           | 3       | 388838 410073 |
| 2      | <b>Local Authority Pollution Prevention and Controls</b><br>Name: Lew Diecasting Ltd<br>Location: Trows Lane, Castleton, ROCHDALE, Lancashire, OL11 2UF<br>Authority: Rochdale Metropolitan Borough Council, Environmental Health Department<br>Permit Reference: 37/05<br>Dated: Not Supplied<br>Process Type: Local Authority Air Pollution Control<br>Description: PG2/3 Electrical and rotary furnaces<br><b>Status: Authorised</b><br>Positional Accuracy: Manually positioned to the address or location                      | A6NW (SW)                              | 52                           | 3       | 388838 410073 |
| 2      | <b>Local Authority Pollution Prevention and Controls</b><br>Name: Lew Diecastings Ltd<br>Location: Trows Lane, Rochdale, Lancashire, OL11 2UF<br>Authority: Rochdale Metropolitan Borough Council, Environmental Health Department<br>Permit Reference: 37/05<br>Dated: Not Supplied<br>Process Type: Local Authority Air Pollution Control<br>Description: PG2/8 Copper and copper alloy processes<br><b>Status: Permitted</b><br>Positional Accuracy: Manually positioned to the address or location                              | A6NW (SW)                              | 52                           | 3       | 388838 410073 |
| 3      | <b>Local Authority Pollution Prevention and Controls</b><br>Name: Omc Ford<br>Location: Manchester Road, Castleton, ROCHDALE, Lancashire, OL11 2TR<br>Authority: Rochdale Metropolitan Borough Council, Environmental Health Department<br>Permit Reference: 58/10<br>Dated: Not Supplied<br>Process Type: Local Authority Air Pollution Control<br>Description: PG6/34 Respraying of road vehicles<br><b>Status: Authorised</b><br>Positional Accuracy: Manually positioned to the address or location                             | A5NE (W)                               | 374                          | 3       | 388500 410026 |
|        | <b>Nearest Surface Water Feature</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | A7NW (SE)                              | 0                            | -       | 389270 410147 |
|        | <b>River Quality</b><br>Name: Rochdale Canal<br>GQA Grade: River Quality B<br>Reach: Qsl At Summit To Empress Processing<br>Estimated Distance (km): 27.6<br>Flow Rate: Flow greater than 80 cumecs<br>Flow Type: Canal<br>Year: 2000                                                                                                                                                                                                                                                                                               | A10SW (NW)                             | 408                          | 2       | 388545 410544 |

| Map ID | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
|        | <b>Water Abstractions</b><br>Operator: Sonoco Industrial Packaging<br>Licence Number: 2569002024<br>Permit Version: Not Supplied<br>Location: Rochdale Canal, Castleton, ROCHDALE, Lancashire<br>Authority: Environment Agency, North West Region<br>Abstraction: Cooling<br>Abstraction Type: Not Supplied<br>Source: Canal<br>Daily Rate (m3): 123<br>Yearly Rate (m3): 30458<br>Details: Licence Status: Revoked<br>Authorised Start: Not Supplied<br>Authorised End: Not Supplied<br>Permit Start Date: Not Supplied<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m                 | A9SE (W)                               | 524                          | 2       | 388400 410500 |
|        | <b>Water Abstractions</b><br>Operator: Mr M Gadhi And Mr A Raazaq<br>Licence Number: 2569002074<br>Permit Version: Not Supplied<br>Location: Rochdale Canal At Queensway, Castleton, ROCHDALE, Lancashire<br>Authority: Environment Agency, North West Region<br>Abstraction: Boiler Feed<br>Abstraction Type: Not Supplied<br>Source: Canal<br>Daily Rate (m3): 114<br>Yearly Rate (m3): 36368<br>Details: Licence Status: Revoked<br>Authorised Start: Not Supplied<br>Authorised End: Not Supplied<br>Permit Start Date: Not Supplied<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | A14SE (N)                              | 722                          | 2       | 389000 411200 |
|        | <b>Water Abstractions</b><br>Operator: M S Gadhi & A Raazaq<br>Licence Number: 2569002026<br>Permit Version: Not Supplied<br>Location: Borehole, Crest Mill, Queensway, ROCHDALE, Lancashire<br>Authority: Environment Agency, North West Region<br>Abstraction: Manufacturing<br>Abstraction Type: Not Supplied<br>Source: Groundwater<br>Daily Rate (m3): 655<br>Yearly Rate (m3): 91829<br>Details: Licence Status: Revoked<br>Authorised Start: Not Supplied<br>Authorised End: Not Supplied<br>Permit Start Date: Not Supplied<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m      | A14NE (N)                              | 817                          | 2       | 389005 411300 |
|        | <b>Groundwater Vulnerability</b><br>Soil Classification: Soils of High Leaching Potential (U) - Soil information for restored mineral workings and urban areas is based on fewer observations than elsewhere. A worst case vulnerability classification (H) assumed, until proved otherwise<br>Map Sheet: Sheet 11 South Pennines<br>Scale: 1:100,000                                                                                                                                                                                                                                                                                | A10SE (W)                              | 0                            | 2       | 388949 410341 |
|        | <b>Groundwater Vulnerability</b><br>Soil Classification: Soils of High Leaching Potential (H2) - Deep, permeable, coarse textured soils which readily transmit a wide range of pollutants because of their rapid drainage and low attenuation potential<br>Map Sheet: Sheet 11 South Pennines<br>Scale: 1:100,000                                                                                                                                                                                                                                                                                                                    | A6NE (N)                               | 0                            | 2       | 389200 410258 |
|        | <b>Drift Deposits</b><br>Drift Deposit: Low permeability drift deposits occurring at the surface and overlying Major and Minor Aquifers are head, clay-with-flints, brickearth, peat, river terrace deposits and marine and estuarine alluvium<br>Map Sheet: Sheet 11 South Pennines<br>Scale: 1:100,000                                                                                                                                                                                                                                                                                                                             | A6NE (SW)                              | 0                            | 2       | 389024 410112 |
|        | <b>Bedrock Aquifer Designations</b><br>Aquifer Designation: Secondary Aquifer - A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | A6NE (N)                               | 0                            | 4       | 389200 410258 |
|        | <b>Superficial Aquifer Designations</b><br>Aquifer Designation: Secondary Aquifer - A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | A6NE (N)                               | 0                            | 4       | 389200 410258 |

| Map ID | Details                                                                                                                                                                                                                                                                                                                                                            | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR              |
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|        | <b>Extreme Flooding from Rivers or Sea without Defences</b><br>None                                                                                                                                                                                                                                                                                                |                                        |                              |         |                  |
|        | <b>Flooding from Rivers or Sea without Defences</b><br>None                                                                                                                                                                                                                                                                                                        |                                        |                              |         |                  |
|        | <b>Areas Benefiting from Flood Defences</b><br>None                                                                                                                                                                                                                                                                                                                |                                        |                              |         |                  |
|        | <b>Flood Water Storage Areas</b><br>None                                                                                                                                                                                                                                                                                                                           |                                        |                              |         |                  |
|        | <b>Flood Defences</b><br>None                                                                                                                                                                                                                                                                                                                                      |                                        |                              |         |                  |
| 4      | <b>Detailed River Network Lines</b><br>River Type: Tertiary River<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference:  | A7NW (SE)                              | 0                            | 2       | 389270<br>410147 |
| 5      | <b>Detailed River Network Lines</b><br>River Type: Tertiary River<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference:  | A6NE (SW)                              | 0                            | 2       | 389188<br>410251 |
| 6      | <b>Detailed River Network Lines</b><br>River Type: Tertiary River<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference:  | A7NW (S)                               | 3                            | 2       | 389214<br>410070 |
| 7      | <b>Detailed River Network Lines</b><br>River Type: Secondary River<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference: | A7NW (S)                               | 4                            | 2       | 389225<br>410081 |

| Map ID | Details                                                                                                                                                                                                                                                                                                                                                                                      | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR              |
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| 8      | <b>Detailed River Network Lines</b><br>River Type: Lake/Reservoir<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference:                            | A7NW (S)                               | 5                            | 2       | 389231<br>410090 |
| 9      | <b>Detailed River Network Lines</b><br>River Type: Secondary River<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference:                           | A7NW (SE)                              | 5                            | 2       | 389351<br>410061 |
| 10     | <b>Detailed River Network Lines</b><br>River Type: Lake/Reservoir<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference:                            | A7NW (S)                               | 6                            | 2       | 389215<br>410119 |
| 11     | <b>Detailed River Network Lines</b><br>River Type: Lake/Reservoir<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference:                            | A7NW (S)                               | 7                            | 2       | 389246<br>410114 |
| 12     | <b>Detailed River Network Lines</b><br>River Type: Extended Culvert (greater than 50m)<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Below Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference: | A7NW (SE)                              | 10                           | 2       | 389523<br>410086 |
| 13     | <b>Detailed River Network Lines</b><br>River Type: Lake/Reservoir<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference:                            | A6NE (S)                               | 12                           | 2       | 389193<br>410044 |

| Map ID | Details                                                                                                                                                                                                                                                                                                                                                            | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
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| 14     | <b>Detailed River Network Lines</b><br>River Type: Lake/Reservoir<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference:  | A6NE (S)                               | 17                           | 2       | 389182 410003 |
| 15     | <b>Detailed River Network Lines</b><br>River Type: Lake/Reservoir<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference:  | A6NE (SW)                              | 32                           | 2       | 389017 410028 |
| 16     | <b>Detailed River Network Lines</b><br>River Type: Secondary River<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference: | A6NE (S)                               | 51                           | 2       | 389156 410024 |
| 17     | <b>Detailed River Network Lines</b><br>River Type: Secondary River<br>River Name: Trub<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference:         | A6NW (SW)                              | 55                           | 2       | 388858 410060 |
| 18     | <b>Detailed River Network Lines</b><br>River Type: Secondary River<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference: | A6NE (S)                               | 63                           | 2       | 389150 410006 |
| 19     | <b>Detailed River Network Lines</b><br>River Type: Secondary River<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference: | A6NE (S)                               | 73                           | 2       | 389141 410003 |



| Map ID | Details                                                                                                                                                                                                                                                                                                                                                                                      | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
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| 20     | <b>Detailed River Network Lines</b><br>River Type: Extended Culvert (greater than 50m)<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Below Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference: | A6NE (S)                               | 84                           | 2       | 389129 410003 |
| 21     | <b>Detailed River Network Lines</b><br>River Type: Extended Culvert (greater than 50m)<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Below Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference: | A6SE (S)                               | 218                          | 2       | 389088 409840 |
| 22     | <b>Detailed River Network Lines</b><br>River Type: Tertiary River<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference:                            | A6SE (SW)                              | 224                          | 2       | 388885 409887 |
| 23     | <b>Detailed River Network Lines</b><br>River Type: Tertiary River<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference:                            | A7NE (E)                               | 228                          | 2       | 389782 410168 |
| 24     | <b>Detailed River Network Lines</b><br>River Type: Extended Culvert (greater than 50m)<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Below Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference: | A7NE (E)                               | 228                          | 2       | 389782 410168 |
| 25     | <b>Detailed River Network Lines</b><br>River Type: Secondary River<br>River Name: Drain<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Drain (ditch, Reen, Rhyne, Drain)<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference:            | A6SE (S)                               | 235                          | 2       | 389073 409844 |

| Map ID | Details                                                                                                                                                                                                                                                                                                                                                                                      | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR              |
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| 26     | <b>Detailed River Network Lines</b><br>River Type: Tertiary River<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference:                            | A6SE (SW)                              | 259                          | 2       | 388945<br>409848 |
| 27     | <b>Detailed River Network Lines</b><br>River Type: Tertiary River<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference:                            | A6SW (SW)                              | 291                          | 2       | 388856<br>409787 |
| 28     | <b>Detailed River Network Lines</b><br>River Type: Tertiary River<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference:                            | A6SW (SW)                              | 291                          | 2       | 388706<br>409874 |
| 29     | <b>Detailed River Network Lines</b><br>River Type: Extended Culvert (greater than 50m)<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Below Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference: | A6SW (SW)                              | 292                          | 2       | 388675<br>409896 |
| 30     | <b>Detailed River Network Lines</b><br>River Type: Tertiary River<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference:                            | A7NE (E)                               | 297                          | 2       | 389850<br>410084 |
| 31     | <b>Detailed River Network Lines</b><br>River Type: Tertiary River<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference:                            | A6SW (SW)                              | 327                          | 2       | 388865<br>409785 |

| Map ID | Details                                                                                                                                                                                                                                                                                                                                                            | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR              |
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| 32     | <b>Detailed River Network Lines</b><br>River Type: Secondary River<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference: | A6NW (SW)                              | 343                          | 2       | 388550<br>409978 |
| 33     | <b>Detailed River Network Lines</b><br>River Type: Tertiary River<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Surface<br>Drain Feature: Not a Drain<br>Flood Risk: Other Rivers<br>Management Status:<br>Water Course: Not Supplied<br>Name:<br>Water Course: Not Supplied<br>Reference:  | A7SE (SE)                              | 457                          | 2       | 389703<br>409675 |
|        | <b>Detailed River Network Offline Drainage</b><br>None                                                                                                                                                                                                                                                                                                             |                                        |                              |         |                  |

| Map ID | Details                                                                                                                     | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR              |
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|        | <b>Local Authority Landfill Coverage</b><br>Name: Rochdale Metropolitan Borough Council<br>- Has no landfill data to supply |                                        | 0                            | 3       | 389200<br>410258 |

| Map ID | Details                                                                                                                                                                                                                                                                                                                                                               | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
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|        | <b>BGS 1:625,000 Solid Geology</b><br>Description: Pennine Lower Coal Measures Formation And South Wales Lower Coal Measures Formation (Undifferentiated)                                                                                                                                                                                                             | A6NE (N)                               | 0                            | 4       | 389200 410258 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: RuSoilExAs<br>Arsenic: 15 - 25 mg/kg<br>Concentration:<br>Cadmium: <1.8 mg/kg<br>Concentration:<br>Chromium: 60 - 90 mg/kg<br>Concentration:<br>Lead Concentration: <150 mg/kg<br>Nickel: 15 - 30 mg/kg<br>Concentration:      | A6NE (W)                               | 0                            | 4       | 389000 410258 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: RuSoilExAs<br>Arsenic: 15 - 25 mg/kg<br>Concentration:<br>Cadmium: <1.8 mg/kg<br>Concentration:<br>Chromium: 60 - 90 mg/kg<br>Concentration:<br>Lead Concentration: <150 mg/kg<br>Nickel: 15 - 30 mg/kg<br>Concentration:      | A6NE (N)                               | 0                            | 4       | 389200 410258 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: RuSoilExAs<br>Arsenic: 15 - 25 mg/kg<br>Concentration:<br>Cadmium: <1.8 mg/kg<br>Concentration:<br>Chromium: 60 - 90 mg/kg<br>Concentration:<br>Lead Concentration: <150 mg/kg<br>Nickel: 15 - 30 mg/kg<br>Concentration:      | A6NE (S)                               | 19                           | 4       | 389200 410000 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: RuSoilExAs<br>Arsenic: 15 - 25 mg/kg<br>Concentration:<br>Cadmium: <1.8 mg/kg<br>Concentration:<br>Chromium: 60 - 90 mg/kg<br>Concentration:<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel: 15 - 30 mg/kg<br>Concentration: | A6NE (SW)                              | 22                           | 4       | 389000 410080 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: RuSoilExAs<br>Arsenic: 15 - 25 mg/kg<br>Concentration:<br>Cadmium: <1.8 mg/kg<br>Concentration:<br>Chromium: 60 - 90 mg/kg<br>Concentration:<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel: 15 - 30 mg/kg<br>Concentration: | A6NE (SW)                              | 43                           | 4       | 389094 410045 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: RuSoilExAs<br>Arsenic: 15 - 25 mg/kg<br>Concentration:<br>Cadmium: <1.8 mg/kg<br>Concentration:<br>Chromium: 60 - 90 mg/kg<br>Concentration:<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel: 15 - 30 mg/kg<br>Concentration: | A6NE (S)                               | 60                           | 4       | 389158 410000 |

| Map ID | Details                                                                                                                                                                                                                                                                                                                                                               | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
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|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: RuSoilExAs<br>Arsenic: 15 - 25 mg/kg<br>Concentration:<br>Cadmium: <1.8 mg/kg<br>Concentration:<br>Chromium: 60 - 90 mg/kg<br>Concentration:<br>Lead Concentration: <150 mg/kg<br>Nickel: 15 - 30 mg/kg<br>Concentration:      | A6NE (SW)                              | 109                          | 4       | 388922 410000 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: RuSoilExAs<br>Arsenic: 25 - 35 mg/kg<br>Concentration:<br>Cadmium: <1.8 mg/kg<br>Concentration:<br>Chromium: 60 - 90 mg/kg<br>Concentration:<br>Lead Concentration: <150 mg/kg<br>Nickel: 15 - 30 mg/kg<br>Concentration:      | A6NE (SW)                              | 112                          | 4       | 389000 409957 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: RuSoilExAs<br>Arsenic: 15 - 25 mg/kg<br>Concentration:<br>Cadmium: <1.8 mg/kg<br>Concentration:<br>Chromium: 60 - 90 mg/kg<br>Concentration:<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel: 15 - 30 mg/kg<br>Concentration: | A6NE (SW)                              | 112                          | 4       | 389000 410000 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: RuSoilExAs<br>Arsenic: 15 - 25 mg/kg<br>Concentration:<br>Cadmium: <1.8 mg/kg<br>Concentration:<br>Chromium: 60 - 90 mg/kg<br>Concentration:<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel: 15 - 30 mg/kg<br>Concentration: | A6NE (SW)                              | 113                          | 4       | 388897 410000 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: RuSoilExAs<br>Arsenic: 15 - 25 mg/kg<br>Concentration:<br>Cadmium: <1.8 mg/kg<br>Concentration:<br>Chromium: 60 - 90 mg/kg<br>Concentration:<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel: 15 - 30 mg/kg<br>Concentration: | A10SW (NW)                             | 191                          | 4       | 388788 410502 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: RuSoilExAs<br>Arsenic: 15 - 25 mg/kg<br>Concentration:<br>Cadmium: <1.8 mg/kg<br>Concentration:<br>Chromium: 60 - 90 mg/kg<br>Concentration:<br>Lead Concentration: <150 mg/kg<br>Nickel: 15 - 30 mg/kg<br>Concentration:      | A11SE (NE)                             | 246                          | 4       | 389612 410567 |



| Map ID | Details                                                                                                                                                                                                                                                                                                                                                           | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: RuSoilExAs<br>Arsenic 15 - 25 mg/kg<br>Concentration:<br>Cadmium <1.8 mg/kg<br>Concentration:<br>Chromium 60 - 90 mg/kg<br>Concentration:<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel 15 - 30 mg/kg<br>Concentration: | A11NW (N)                              | 361                          | 4       | 389203 410886 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: RuSoilExAs<br>Arsenic 15 - 25 mg/kg<br>Concentration:<br>Cadmium <1.8 mg/kg<br>Concentration:<br>Chromium 60 - 90 mg/kg<br>Concentration:<br>Lead Concentration: <150 mg/kg<br>Nickel 15 - 30 mg/kg<br>Concentration:      | A8NW (E)                               | 444                          | 4       | 390000 410258 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: RuSoilExAs<br>Arsenic 15 - 25 mg/kg<br>Concentration:<br>Cadmium <1.8 mg/kg<br>Concentration:<br>Chromium 60 - 90 mg/kg<br>Concentration:<br>Lead Concentration: <150 mg/kg<br>Nickel 15 - 30 mg/kg<br>Concentration:      | A8NW (E)                               | 456                          | 4       | 390000 410025 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic 15 - 25 mg/kg<br>Concentration:<br>Cadmium <1.8 mg/kg<br>Concentration:<br>Chromium 60 - 90 mg/kg<br>Concentration:<br>Lead Concentration: <150 mg/kg<br>Nickel 15 - 30 mg/kg<br>Concentration:        | A15SW (N)                              | 457                          | 4       | 389260 411000 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: RuSoilExAs<br>Arsenic 25 - 35 mg/kg<br>Concentration:<br>Cadmium <1.8 mg/kg<br>Concentration:<br>Chromium 60 - 90 mg/kg<br>Concentration:<br>Lead Concentration: <150 mg/kg<br>Nickel 15 - 30 mg/kg<br>Concentration:      | A8NW (E)                               | 461                          | 4       | 390000 410000 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic 15 - 25 mg/kg<br>Concentration:<br>Cadmium <1.8 mg/kg<br>Concentration:<br>Chromium 60 - 90 mg/kg<br>Concentration:<br>Lead Concentration: <150 mg/kg<br>Nickel 15 - 30 mg/kg<br>Concentration:        | A15SW (N)                              | 462                          | 4       | 389208 411000 |

| Map ID | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic: 15 - 25 mg/kg<br>Concentration:<br>Cadmium: <1.8 mg/kg<br>Concentration:<br>Chromium: 60 - 90 mg/kg<br>Concentration:<br>Lead Concentration: <150 mg/kg<br>Nickel: 15 - 30 mg/kg<br>Concentration:                                                                                                                               | A14SE (N)                              | 472                          | 4       | 389200 411000 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: RuSoilExAs<br>Arsenic: 25 - 35 mg/kg<br>Concentration:<br>Cadmium: <1.8 mg/kg<br>Concentration:<br>Chromium: 60 - 90 mg/kg<br>Concentration:<br>Lead Concentration: <150 mg/kg<br>Nickel: 15 - 30 mg/kg<br>Concentration:                                                                                                                             | A8NW (E)                               | 478                          | 4       | 390017 410000 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic: 15 - 25 mg/kg<br>Concentration:<br>Cadmium: <1.8 mg/kg<br>Concentration:<br>Chromium: 60 - 90 mg/kg<br>Concentration:<br>Lead Concentration: <150 mg/kg<br>Nickel: 15 - 30 mg/kg<br>Concentration:                                                                                                                               | A14SE (N)                              | 490                          | 4       | 389146 411000 |
| 34     | <b>BGS Recorded Mineral Sites</b><br>Site Name: Windy Bank Sand Pit<br>Location: , Castleton, Rochdale, Lancashire<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 96584<br>Type: Opencast<br><b>Status: Ceased</b><br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Glaciofluvial Deposits, Devensian<br>Commodity: Sand<br>Positional Accuracy: Located by supplier to within 10m | A10SE (NW)                             | 99                           | 4       | 388893 410507 |
| 35     | <b>BGS Recorded Mineral Sites</b><br>Site Name: Windy Bank Sand Pit<br>Location: , Castleton, Rochdale, Lancashire<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 96583<br>Type: Opencast<br><b>Status: Ceased</b><br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Glaciofluvial Deposits, Devensian<br>Commodity: Sand<br>Positional Accuracy: Located by supplier to within 10m | A10SW (W)                              | 107                          | 4       | 388811 410387 |
| 36     | <b>BGS Recorded Mineral Sites</b><br>Site Name: Castleton<br>Location: , Castleton, Rochdale, Lancashire<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 15322<br>Type: Opencast<br><b>Status: Ceased</b><br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Glaciofluvial Deposits, Devensian<br>Commodity: Sand<br>Positional Accuracy: Located by supplier to within 10m           | A7SW (S)                               | 199                          | 4       | 389265 409820 |

| Map ID | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
| 37     | <b>BGS Recorded Mineral Sites</b><br>Site Name: Castleton<br>Location: , Castleton, Rochdale, Lancashire<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 15321<br>Type: Opencast<br><b>Status: Ceased</b><br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Glaciofluvial Deposits, Devensian<br>Commodity: Sand<br>Positional Accuracy: Located by supplier to within 10m | A6SW (SW)                              | 300                          | 4       | 388760 409835 |
|        | <b>BGS Measured Urban Soil Chemistry</b><br>No data available                                                                                                                                                                                                                                                                                                                                                                                                                      |                                        |                              |         |               |
|        | <b>BGS Urban Soil Chemistry Averages</b><br>No data available                                                                                                                                                                                                                                                                                                                                                                                                                      |                                        |                              |         |               |
|        | <b>Coal Mining Affected Areas</b><br>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.                                                                                                                                                                                                           | A6NE (N)                               | 0                            | 5       | 389200 410258 |
|        | <b>Mining Instability</b><br>Mining Evidence: Inconclusive Coal Mining<br>Source: Ove Arup & Partners<br>Boundary Quality: As Supplied                                                                                                                                                                                                                                                                                                                                             | A6NE (N)                               | 0                            | -       | 389200 410258 |
|        | <b>Non Coal Mining Areas of Great Britain</b><br>No Hazard                                                                                                                                                                                                                                                                                                                                                                                                                         |                                        |                              |         |               |
|        | <b>Potential for Collapsible Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                                                                                                                                                                                                                              | A6NE (N)                               | 0                            | 4       | 389200 410258 |
|        | <b>Potential for Collapsible Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                                                                                                                                                                                                                              | A6NE (S)                               | 19                           | 4       | 389200 410000 |
|        | <b>Potential for Compressible Ground Stability Hazards</b><br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                                                                                                                                                                                                                            | A6NE (N)                               | 0                            | 4       | 389200 410258 |
|        | <b>Potential for Compressible Ground Stability Hazards</b><br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                                                                                                                                                                                                                            | A6NE (S)                               | 19                           | 4       | 389200 410000 |
|        | <b>Potential for Compressible Ground Stability Hazards</b><br>Hazard Potential: Moderate<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                                                                                                                                                                                                                             | A6SE (S)                               | 192                          | 4       | 389200 409830 |
|        | <b>Potential for Ground Dissolution Stability Hazards</b><br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                                                                                                                                                                                                                             | A6NE (N)                               | 0                            | 4       | 389200 410258 |
|        | <b>Potential for Ground Dissolution Stability Hazards</b><br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                                                                                                                                                                                                                             | A6NE (S)                               | 19                           | 4       | 389200 410000 |
|        | <b>Potential for Landslide Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                                                                                                                                                                                                                                | A6NE (N)                               | 0                            | 4       | 389200 410258 |
|        | <b>Potential for Landslide Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                                                                                                                                                                                                                                | A6NE (S)                               | 19                           | 4       | 389200 410000 |
|        | <b>Potential for Running Sand Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                                                                                                                                                                                                                             | A6NE (N)                               | 0                            | 4       | 389200 410258 |
|        | <b>Potential for Running Sand Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                                                                                                                                                                                                                             | A6NE (S)                               | 19                           | 4       | 389200 410000 |
|        | <b>Potential for Shrinking or Swelling Clay Ground Stability Hazards</b><br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                                                                                                                                                                                                              | A6NE (W)                               | 0                            | 4       | 388874 410127 |

| Map ID | Details                                                                                                                                                                                                                                               | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
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|        | <b>Potential for Shrinking or Swelling Clay Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service                                                                  | A6NE (SW)                              | 0                            | 4       | 389101 410041 |
|        | <b>Potential for Shrinking or Swelling Clay Ground Stability Hazards</b><br>Hazard Potential: Low<br>Source: British Geological Survey, National Geoscience Information Service                                                                       | A6NE (N)                               | 0                            | 4       | 389200 410258 |
|        | <b>Potential for Shrinking or Swelling Clay Ground Stability Hazards</b><br>Hazard Potential: Low<br>Source: British Geological Survey, National Geoscience Information Service                                                                       | A6NE (S)                               | 19                           | 4       | 389200 410000 |
|        | <b>Potential for Shrinking or Swelling Clay Ground Stability Hazards</b><br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service                                                                 | A6NE (S)                               | 48                           | 4       | 389172 410000 |
|        | <b>Potential for Shrinking or Swelling Clay Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service                                                                  | A6NE (S)                               | 50                           | 4       | 389172 410000 |
|        | <b>Potential for Shrinking or Swelling Clay Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service                                                                  | A7NE (SE)                              | 62                           | 4       | 389578 410036 |
|        | <b>Potential for Shrinking or Swelling Clay Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service                                                                  | A7NE (SE)                              | 108                          | 4       | 389575 410000 |
|        | <b>Potential for Shrinking or Swelling Clay Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service                                                                  | A10SW (NW)                             | 187                          | 4       | 388809 410537 |
|        | <b>Radon Potential - Radon Protection Measures</b><br>Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions<br>Source: British Geological Survey, National Geoscience Information Service | A6NE (N)                               | 0                            | 4       | 389200 410258 |
|        | <b>Radon Potential - Radon Affected Areas</b><br>Affected Area: The property is in a lower probability radon area, as less than 1% of homes are above the action level<br>Source: British Geological Survey, National Geoscience Information Service  | A6NE (N)                               | 0                            | 4       | 389200 410258 |

| Map ID | Details                                                                                                                                                                                                                                                                                                                        | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
| 38     | <b>Contemporary Trade Directory Entries</b><br>Name: Castleton Motor Bodies<br>Location: Grange Mill, Trows Lane, Rochdale, Lancashire, OL11 2UF<br>Classification: Car Body Repairs<br><b>Status:</b> <b>Inactive</b><br>Positional Accuracy: Manually positioned within the geographical locality                            | A6NE (SW)                              | 12                           | -       | 389016 410134 |
| 38     | <b>Contemporary Trade Directory Entries</b><br>Name: L J Autos<br>Location: Unit 1 Grange Works, Trows Lane, Rochdale, Lancashire, OL11 2UF<br>Classification: Garage Services<br><b>Status:</b> <b>Inactive</b><br>Positional Accuracy: Manually positioned within the geographical locality                                  | A6NE (SW)                              | 12                           | -       | 389016 410134 |
| 38     | <b>Contemporary Trade Directory Entries</b><br>Name: Discount Cars Of Rochdale<br>Location: 1 Trows La, Rochdale, Lancashire, OL11 2UF<br>Classification: Car Dealers - Used<br><b>Status:</b> <b>Active</b><br>Positional Accuracy: Manually positioned within the geographical locality                                      | A6NE (SW)                              | 12                           | -       | 389016 410134 |
| 39     | <b>Contemporary Trade Directory Entries</b><br>Name: Brushstrokes<br>Location: The Grange, Trows Lane, Rochdale, Lancashire, OL11 2UE<br>Classification: Floor Cleaning & Polishing Equipment - Manufacturers & Distributors<br><b>Status:</b> <b>Inactive</b><br>Positional Accuracy: Automatically positioned to the address | A6NE (SW)                              | 28                           | -       | 389119 410116 |

| Map ID | Details                                                                                                                                                                                              | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
| 40     | <b>Areas of Adopted Green Belt</b><br>Authority: Rochdale Metropolitan Borough Council<br>Plan Name: Rochdale Unitary Development Plan<br><b>Status:</b> <b>Adopted</b><br>Plan Date: 30th June 2006 | A7SW (S)                               | 99                           | 6       | 389245 409918 |
| 41     | <b>Nitrate Vulnerable Zones</b><br>Name: Not Supplied<br>Description: Surface Water<br>Source: Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)                            | A6NE (N)                               | 0                            | 9       | 389200 410258 |



| Agency & Hydrological                                                                                                                                                                                                    | Version                      | Update Cycle                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|------------------------------------------------|
| <b>Contaminated Land Register Entries and Notices</b><br>Rochdale Metropolitan Borough Council - Environmental Health Department<br>Oldham Metropolitan Borough Council - Environmental Health Department                | March 2015<br>September 2013 | Annually<br>Annual Rolling Update              |
| <b>Discharge Consents</b><br>Environment Agency - North West Region                                                                                                                                                      | November 2015                | Quarterly                                      |
| <b>Enforcement and Prohibition Notices</b><br>Environment Agency - North West Region                                                                                                                                     | March 2013                   | As notified                                    |
| <b>Integrated Pollution Controls</b><br>Environment Agency - North West Region                                                                                                                                           | October 2008                 | Not Applicable                                 |
| <b>Integrated Pollution Prevention And Control</b><br>Environment Agency - North West Region                                                                                                                             | October 2015                 | Quarterly                                      |
| <b>Local Authority Integrated Pollution Prevention And Control</b><br>Rochdale Metropolitan Borough Council - Environmental Health Department<br>Oldham Metropolitan Borough Council - Environmental Health Department   | July 2014<br>March 2015      | Annual Rolling Update<br>Annual Rolling Update |
| <b>Local Authority Pollution Prevention and Controls</b><br>Rochdale Metropolitan Borough Council - Environmental Health Department<br>Oldham Metropolitan Borough Council - Environmental Health Department             | July 2014<br>March 2015      | Annual Rolling Update<br>Annual Rolling Update |
| <b>Local Authority Pollution Prevention and Control Enforcements</b><br>Rochdale Metropolitan Borough Council - Environmental Health Department<br>Oldham Metropolitan Borough Council - Environmental Health Department | July 2014<br>September 2013  | Annual Rolling Update<br>Annual Rolling Update |
| <b>Nearest Surface Water Feature</b><br>Ordnance Survey                                                                                                                                                                  | July 2012                    | Quarterly                                      |
| <b>Pollution Incidents to Controlled Waters</b><br>Environment Agency - North West Region                                                                                                                                | January 2000                 | Not Applicable                                 |
| <b>Prosecutions Relating to Authorised Processes</b><br>Environment Agency - North West Region                                                                                                                           | March 2013                   | As notified                                    |
| <b>Prosecutions Relating to Controlled Waters</b><br>Environment Agency - North West Region                                                                                                                              | March 2013                   | As notified                                    |
| <b>River Quality</b><br>Environment Agency - Head Office                                                                                                                                                                 | November 2001                | Not Applicable                                 |
| <b>River Quality Biology Sampling Points</b><br>Environment Agency - Head Office                                                                                                                                         | July 2012                    | Annually                                       |
| <b>River Quality Chemistry Sampling Points</b><br>Environment Agency - Head Office                                                                                                                                       | July 2012                    | Annually                                       |
| <b>Substantiated Pollution Incident Register</b><br>Environment Agency - North West Region - South Area                                                                                                                  | October 2015                 | Quarterly                                      |
| <b>Water Abstractions</b><br>Environment Agency - North West Region                                                                                                                                                      | July 2015                    | Quarterly                                      |
| <b>Water Industry Act Referrals</b><br>Environment Agency - North West Region                                                                                                                                            | October 2015                 | Quarterly                                      |
| <b>Groundwater Vulnerability</b><br>Environment Agency - Head Office                                                                                                                                                     | April 2015                   | Not Applicable                                 |
| <b>Drift Deposits</b><br>Environment Agency - Head Office                                                                                                                                                                | January 1999                 | Not Applicable                                 |
| <b>Bedrock Aquifer Designations</b><br>British Geological Survey - National Geoscience Information Service                                                                                                               | October 2012                 | As notified                                    |
| <b>Superficial Aquifer Designations</b><br>British Geological Survey - National Geoscience Information Service                                                                                                           | January 2015                 | As notified                                    |
| <b>Source Protection Zones</b><br>Environment Agency - Head Office                                                                                                                                                       | October 2015                 | Quarterly                                      |

| Agency & Hydrological                                                                                                                                            | Version              | Update Cycle                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----------------------------------|
| <b>Extreme Flooding from Rivers or Sea without Defences</b><br>Environment Agency - Head Office                                                                  | November 2015        | Quarterly                        |
| <b>Flooding from Rivers or Sea without Defences</b><br>Environment Agency - Head Office                                                                          | November 2015        | Quarterly                        |
| <b>Areas Benefiting from Flood Defences</b><br>Environment Agency - Head Office                                                                                  | November 2015        | Quarterly                        |
| <b>Flood Water Storage Areas</b><br>Environment Agency - Head Office                                                                                             | November 2015        | Quarterly                        |
| <b>Flood Defences</b><br>Environment Agency - Head Office                                                                                                        | November 2015        | Quarterly                        |
| <b>Detailed River Network Lines</b><br>Environment Agency - Head Office                                                                                          | March 2012           | Annually                         |
| <b>Detailed River Network Offline Drainage</b><br>Environment Agency - Head Office                                                                               | March 2012           | Annually                         |
| <b>Surface Water 1 in 30 year Flood Extent</b><br>Environment Agency - Head Office                                                                               | October 2013         | As notified                      |
| <b>Surface Water 1 in 100 year Flood Extent</b><br>Environment Agency - Head Office                                                                              | October 2013         | As notified                      |
| <b>Surface Water 1 in 1000 year Flood Extent</b><br>Environment Agency - Head Office                                                                             | October 2013         | As notified                      |
| <b>Surface Water Suitability</b><br>Environment Agency - Head Office                                                                                             | October 2013         | As notified                      |
| Waste                                                                                                                                                            | Version              | Update Cycle                     |
| <b>BGS Recorded Landfill Sites</b><br>British Geological Survey - National Geoscience Information Service                                                        | June 1996            | Not Applicable                   |
| <b>Integrated Pollution Control Registered Waste Sites</b><br>Environment Agency - North West Region                                                             | October 2008         | Not Applicable                   |
| <b>Licensed Waste Management Facilities (Landfill Boundaries)</b><br>Environment Agency - North West Region - South Area                                         | August 2014          | Quarterly                        |
| <b>Licensed Waste Management Facilities (Locations)</b><br>Environment Agency - North West Region - South Area                                                   | October 2015         | Quarterly                        |
| <b>Local Authority Landfill Coverage</b><br>Oldham Metropolitan Borough Council<br>Rochdale Metropolitan Borough Council - Environmental Health Department       | May 2000<br>May 2000 | Not Applicable<br>Not Applicable |
| <b>Local Authority Recorded Landfill Sites</b><br>Oldham Metropolitan Borough Council<br>Rochdale Metropolitan Borough Council - Environmental Health Department | May 2000<br>May 2000 | Not Applicable<br>Not Applicable |
| <b>Registered Landfill Sites</b><br>Environment Agency - North West Region - South Area                                                                          | March 2003           | Not Applicable                   |
| <b>Registered Waste Transfer Sites</b><br>Environment Agency - North West Region - South Area                                                                    | March 2003           | Not Applicable                   |
| <b>Registered Waste Treatment or Disposal Sites</b><br>Environment Agency - North West Region - South Area                                                       | March 2003           | Not Applicable                   |

| Hazardous Substances                                                                                                                            | Version                        | Update Cycle                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|------------------------------------------------|
| <b>Control of Major Accident Hazards Sites (COMAH)</b><br>Health and Safety Executive                                                           | June 2015                      | Bi-Annually                                    |
| <b>Explosive Sites</b><br>Health and Safety Executive                                                                                           | June 2015                      | Bi-Annually                                    |
| <b>Notification of Installations Handling Hazardous Substances (NIHHS)</b><br>Health and Safety Executive                                       | November 2000                  | Not Applicable                                 |
| <b>Planning Hazardous Substance Enforcements</b><br>Oldham Metropolitan Borough Council<br>Rochdale Metropolitan Borough Council                | January 2015<br>September 2014 | Annual Rolling Update<br>Annual Rolling Update |
| <b>Planning Hazardous Substance Consents</b><br>Oldham Metropolitan Borough Council<br>Rochdale Metropolitan Borough Council                    | January 2015<br>September 2014 | Annual Rolling Update<br>Annual Rolling Update |
| Geological                                                                                                                                      | Version                        | Update Cycle                                   |
| <b>BGS 1:625,000 Solid Geology</b><br>British Geological Survey - National Geoscience Information Service                                       | January 2009                   | Not Applicable                                 |
| <b>BGS Estimated Soil Chemistry</b><br>British Geological Survey - National Geoscience Information Service                                      | January 2010                   | Annually                                       |
| <b>BGS Recorded Mineral Sites</b><br>British Geological Survey - National Geoscience Information Service                                        | November 2015                  | Bi-Annually                                    |
| <b>Brine Compensation Area</b><br>Cheshire Brine Subsidence Compensation Board                                                                  | August 2011                    | Not Applicable                                 |
| <b>Coal Mining Affected Areas</b><br>The Coal Authority - Mining Report Service                                                                 | March 2014                     | As notified                                    |
| <b>Mining Instability</b><br>Ove Arup & Partners                                                                                                | October 2000                   | Not Applicable                                 |
| <b>Non Coal Mining Areas of Great Britain</b><br>British Geological Survey - National Geoscience Information Service                            | July 2014                      | Not Applicable                                 |
| <b>Potential for Collapsible Ground Stability Hazards</b><br>British Geological Survey - National Geoscience Information Service                | June 2015                      | Annually                                       |
| <b>Potential for Compressible Ground Stability Hazards</b><br>British Geological Survey - National Geoscience Information Service               | June 2015                      | Annually                                       |
| <b>Potential for Ground Dissolution Stability Hazards</b><br>British Geological Survey - National Geoscience Information Service                | June 2015                      | Annually                                       |
| <b>Potential for Landslide Ground Stability Hazards</b><br>British Geological Survey - National Geoscience Information Service                  | June 2015                      | Annually                                       |
| <b>Potential for Running Sand Ground Stability Hazards</b><br>British Geological Survey - National Geoscience Information Service               | June 2015                      | Annually                                       |
| <b>Potential for Shrinking or Swelling Clay Ground Stability Hazards</b><br>British Geological Survey - National Geoscience Information Service | June 2015                      | Annually                                       |
| <b>Radon Potential - Radon Affected Areas</b><br>British Geological Survey - National Geoscience Information Service                            | July 2011                      | As notified                                    |
| <b>Radon Potential - Radon Protection Measures</b><br>British Geological Survey - National Geoscience Information Service                       | July 2011                      | As notified                                    |
| Industrial Land Use                                                                                                                             | Version                        | Update Cycle                                   |
| <b>Contemporary Trade Directory Entries</b><br>Thomson Directories                                                                              | November 2015                  | Quarterly                                      |
| <b>Fuel Station Entries</b><br>Catalist Ltd - Experian                                                                                          | August 2015                    | Quarterly                                      |

| Sensitive Land Use                                                                                                   | Version                      | Update Cycle               |
|----------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------|
| <b>Areas of Adopted Green Belt</b><br>Oldham Metropolitan Borough Council<br>Rochdale Metropolitan Borough Council   | November 201<br>November 201 | As notified<br>As notified |
| <b>Areas of Unadopted Green Belt</b><br>Oldham Metropolitan Borough Council<br>Rochdale Metropolitan Borough Council | November 201<br>November 201 | As notified<br>As notified |
| <b>Areas of Outstanding Natural Beauty</b><br>Natural England                                                        | October 2015                 | Bi-Annually                |
| <b>Environmentally Sensitive Areas</b><br>Natural England                                                            | October 2015                 | Annually                   |
| <b>Forest Parks</b><br>Forestry Commission                                                                           | April 1997                   | Not Applicable             |
| <b>Local Nature Reserves</b><br>Natural England                                                                      | October 2015                 | Bi-Annually                |
| <b>Marine Nature Reserves</b><br>Natural England                                                                     | October 2015                 | Bi-Annually                |
| <b>National Nature Reserves</b><br>Natural England                                                                   | October 2015                 | Bi-Annually                |
| <b>National Parks</b><br>Natural England                                                                             | August 2015                  | Bi-Annually                |
| <b>Nitrate Sensitive Areas</b><br>Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)         | October 2015                 | Not Applicable             |
| <b>Nitrate Vulnerable Zones</b><br>Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)        | October 2015                 | Annually                   |
| <b>Ramsar Sites</b><br>Natural England                                                                               | October 2015                 | Bi-Annually                |
| <b>Sites of Special Scientific Interest</b><br>Natural England                                                       | October 2015                 | Bi-Annually                |
| <b>Special Areas of Conservation</b><br>Natural England                                                              | October 2015                 | Bi-Annually                |
| <b>Special Protection Areas</b><br>Natural England                                                                   | October 2015                 | Bi-Annually                |

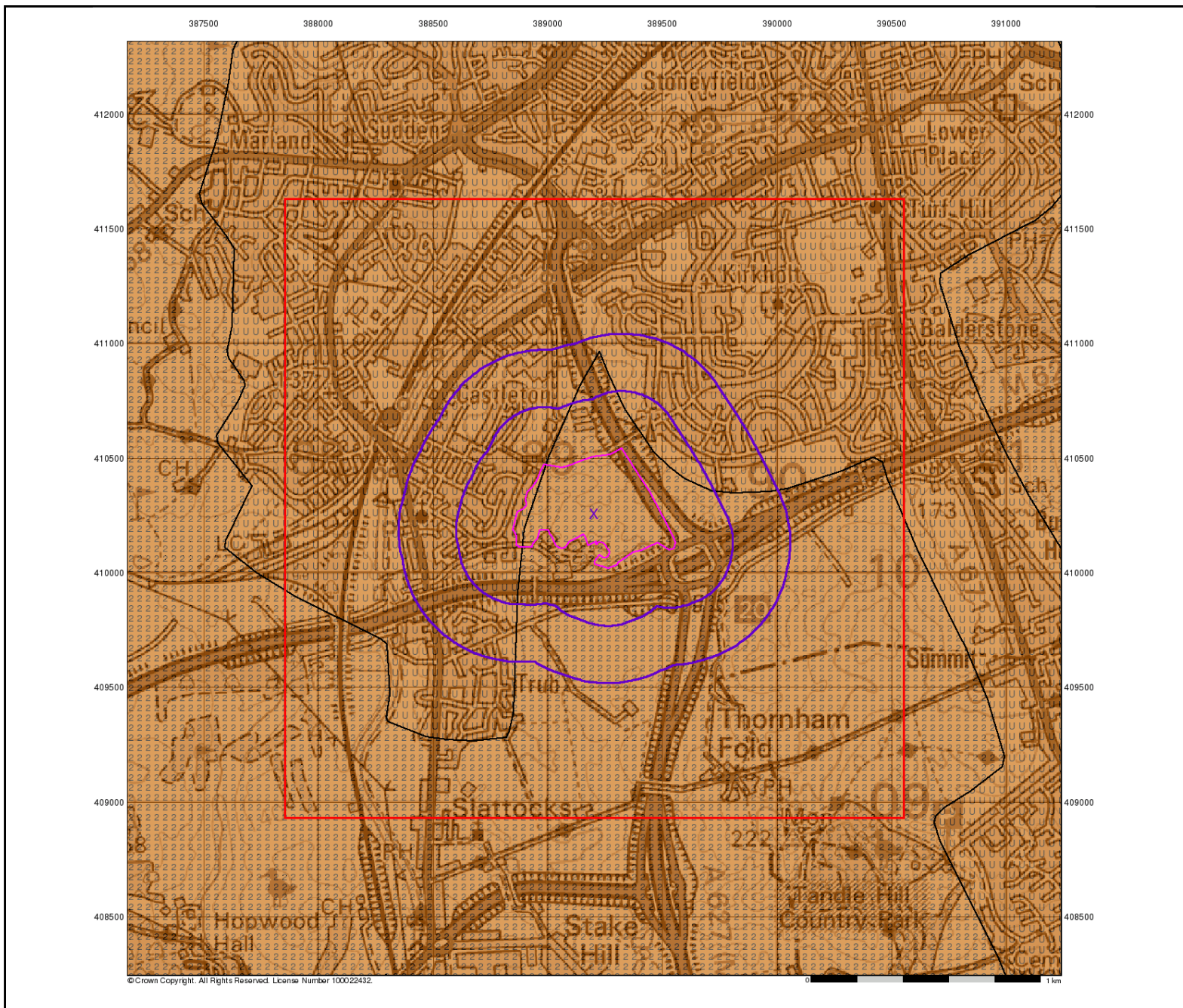
A selection of organisations who provide data within this report

| Data Supplier                          | Data Supplier Logo                                                                    |
|----------------------------------------|---------------------------------------------------------------------------------------|
| Ordnance Survey                        |    |
| Environment Agency                     |    |
| Scottish Environment Protection Agency |    |
| The Coal Authority                     |    |
| British Geological Survey              |    |
| Centre for Ecology and Hydrology       |    |
| Natural Resources Wales                |   |
| Scottish Natural Heritage              |  |
| Natural England                        |  |
| Public Health England                  |  |
| Ove Arup                               |  |
| Peter Brett Associates                 |  |

| Contact | Name and Address                                                                                                                                                     | Contact Details                                                                                                                                                                                                                      |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2       | <b>Environment Agency - National Customer Contact Centre (NCCC)</b><br>PO Box 544, Templeborough, Rotherham, S60 1BY                                                 | Telephone: 03708 506 506<br>Email: <a href="mailto:enquiries@environment-agency.gov.uk">enquiries@environment-agency.gov.uk</a>                                                                                                      |
| 3       | <b>Rochdale Metropolitan Borough Council - Environmental Health Department</b><br>P O Box 32, Telegraph House, Ballie Street, Rochdale, Greater Manchester, OL16 1JH | Telephone: 01706 864139<br>Fax: 01706 864185<br>Website: <a href="http://www.rochdale.gov.uk">www.rochdale.gov.uk</a>                                                                                                                |
| 4       | <b>British Geological Survey - Enquiry Service</b><br>British Geological Survey, Kingsley Dunham Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG             | Telephone: 0115 936 3143<br>Fax: 0115 936 3276<br>Email: <a href="mailto:enquiries@bgs.ac.uk">enquiries@bgs.ac.uk</a><br>Website: <a href="http://www.bgs.ac.uk">www.bgs.ac.uk</a>                                                   |
| 5       | <b>The Coal Authority - Mining Report Service</b><br>200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG                                                        | Telephone: 0845 7626848<br>Email: <a href="mailto:thecoalauthority@coal.gov.uk">thecoalauthority@coal.gov.uk</a>                                                                                                                     |
| 6       | <b>Rochdale Metropolitan Borough Council</b><br>PO Box 15, Town Hall, Rochdale, Greater Manchester, OL16 1AB                                                         | Telephone: 01706 647474<br>Fax: 01706 59475<br>Website: <a href="http://www.rochdale.gov.uk">www.rochdale.gov.uk</a>                                                                                                                 |
| 7       | <b>Oldham Metropolitan Borough Council</b><br>Civic Centre, P O Box 55, West Street, Oldham, Lancashire, OL1 1XN                                                     | Telephone: 0161 911 3000<br>Fax: 0161 678 4550<br>Website: <a href="http://www.oldham.gov.uk">www.oldham.gov.uk</a>                                                                                                                  |
| 8       | <b>Natural England</b><br>Suite D, Unex House, Bourges Boulevard, Peterborough, Cambridgeshire, PE1 1NG                                                              | Telephone: 0845 600 3078<br>Email: <a href="mailto:enquiries@naturalengland.org.uk">enquiries@naturalengland.org.uk</a><br>Website: <a href="http://www.naturalengland.org.uk">www.naturalengland.org.uk</a>                         |
| 9       | <b>Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)</b><br>Government Buildings, Otley Road, Lawnswood, Leeds, West Yorkshire, LS16 5QT    | Telephone: 0113 2613333<br>Fax: 0113 230 0879                                                                                                                                                                                        |
| 10      | <b>Environment Agency - Head Office</b><br>Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, Avon, BS32 4UD                                              | Telephone: 01454 624400<br>Fax: 01454 624409                                                                                                                                                                                         |
| -       | <b>Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards</b><br>Chilton, Didcot, Oxfordshire, OX11 0RQ                      | Telephone: 01235 822622<br>Fax: 01235 833891<br>Email: <a href="mailto:radon@phe.gov.uk">radon@phe.gov.uk</a><br>Website: <a href="http://www.ukradon.org">www.ukradon.org</a>                                                       |
| -       | <b>Landmark Information Group Limited</b><br>Imperium, Imperial Way, Reading, Berkshire, RG2 0TD                                                                     | Telephone: 0844 844 9952<br>Fax: 0844 844 9951<br>Email: <a href="mailto:customerservices@landmarkinfo.co.uk">customerservices@landmarkinfo.co.uk</a><br>Website: <a href="http://www.landmarkinfo.co.uk">www.landmarkinfo.co.uk</a> |

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







## Groundwater Vulnerability

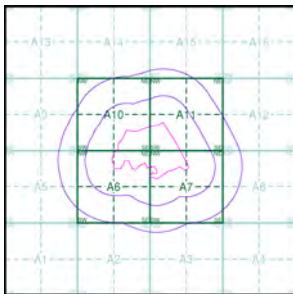
**General**

Specified Site Specified Buffer(s) Bearing Reference Point  
Slice Map ID

**Agency and Hydrological**

| Geological Classes                 | Soil Classes          |
|------------------------------------|-----------------------|
| Major Aquifer (Highly Permeable)   | High (H) 1, 2, 3, U   |
|                                    | Intermediate (I) 1, 2 |
|                                    | Low                   |
| Minor Aquifer (Variably Permeable) | High (H) 1, 2, 3, U   |
|                                    | Intermediate (I) 1, 2 |
|                                    | Low                   |
| Non Aquifer (Negligibly Permeable) |                       |
| Water or Sea                       |                       |
| Drift Deposit                      |                       |

**Site Sensitivity Context Map - Slice A**



**Order Details**

|                          |                |
|--------------------------|----------------|
| Order Number:            | 77317590_1_1   |
| Customer Ref:            | R2228          |
| National Grid Reference: | 389200, 410260 |
| Slice:                   | A              |
| Site Area (Ha):          | 21.43          |
| Search Buffer (m):       | 500            |

**Site Details**  
Site at 389190, 410260

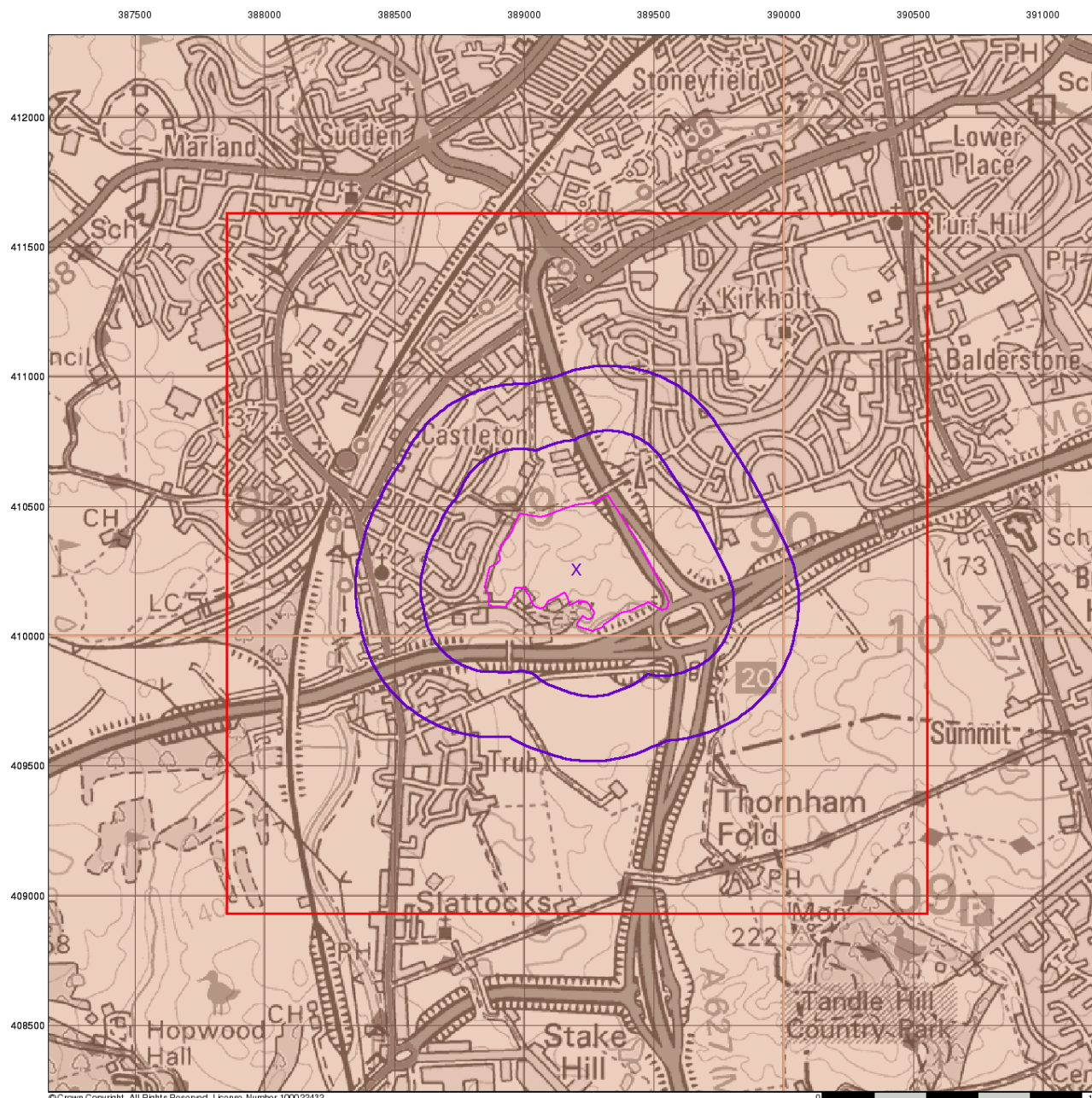


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## Bedrock Aquifer Designation

### General

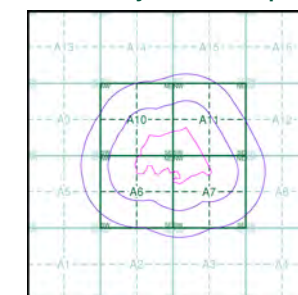
- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

### Agency and Hydrological

#### Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown

### Site Sensitivity Context Map - Slice A



### Order Details

Order Number: 77317590\_1\_1  
 Customer Ref: R2228  
 National Grid Reference: 389200, 410260  
 Slice: A  
 Site Area (Ha): 21.43  
 Search Buffer (m): 500

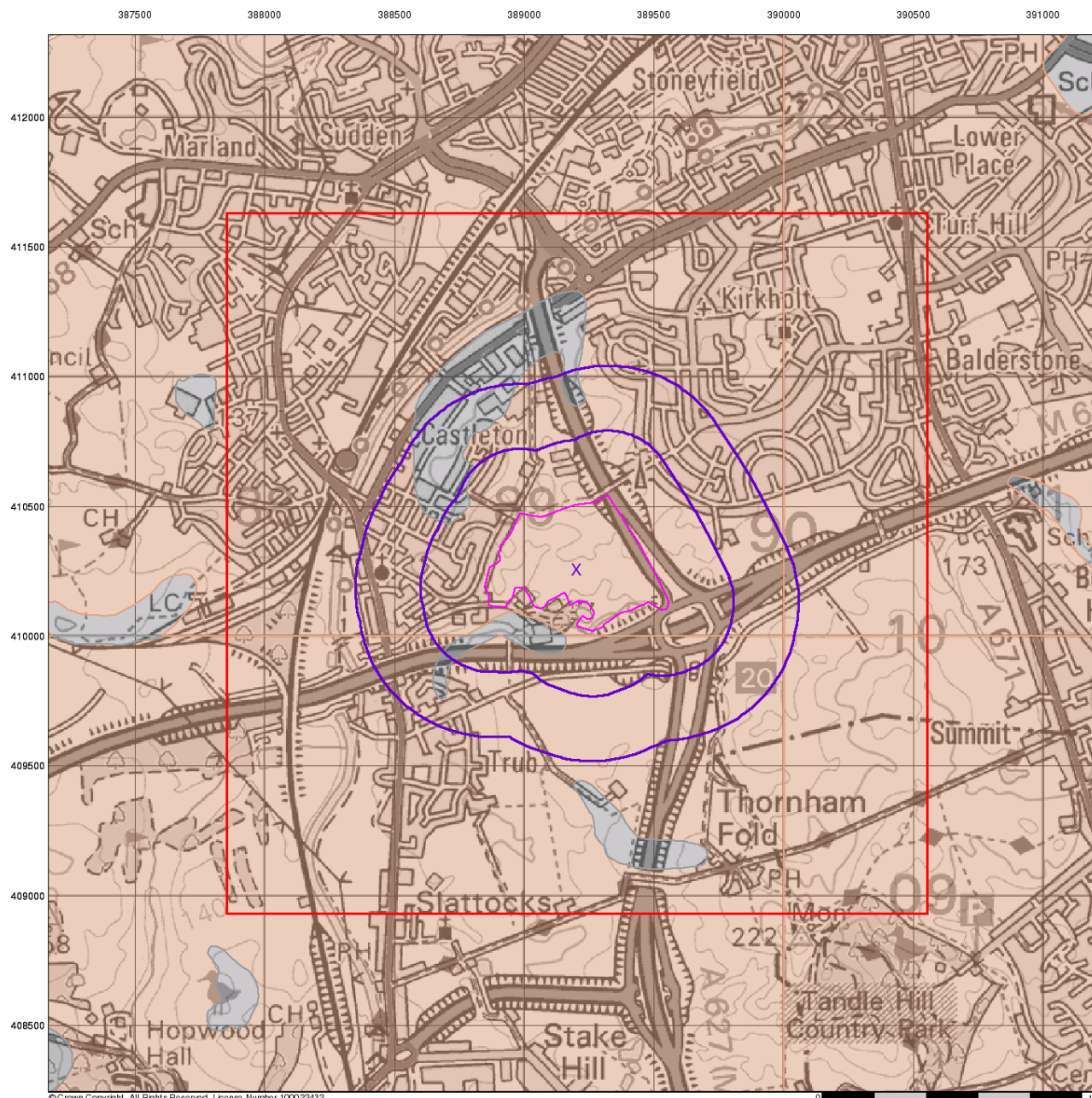
### Site Details

Site at 389190, 410260



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0 1 km



## Superficial Aquifer Designation

### General

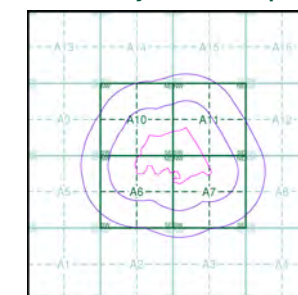
- ▬ Specified Site
- Specified Buffer(s)
- X Bearing Reference Point
- Slice
- B Map ID

### Agency and Hydrological

#### Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown

### Site Sensitivity Context Map - Slice A



### Order Details

Order Number: 77317590\_1\_1  
 Customer Ref: R2228  
 National Grid Reference: 389200, 410260  
 Slice: A  
 Site Area (Ha): 21.43  
 Search Buffer (m): 500

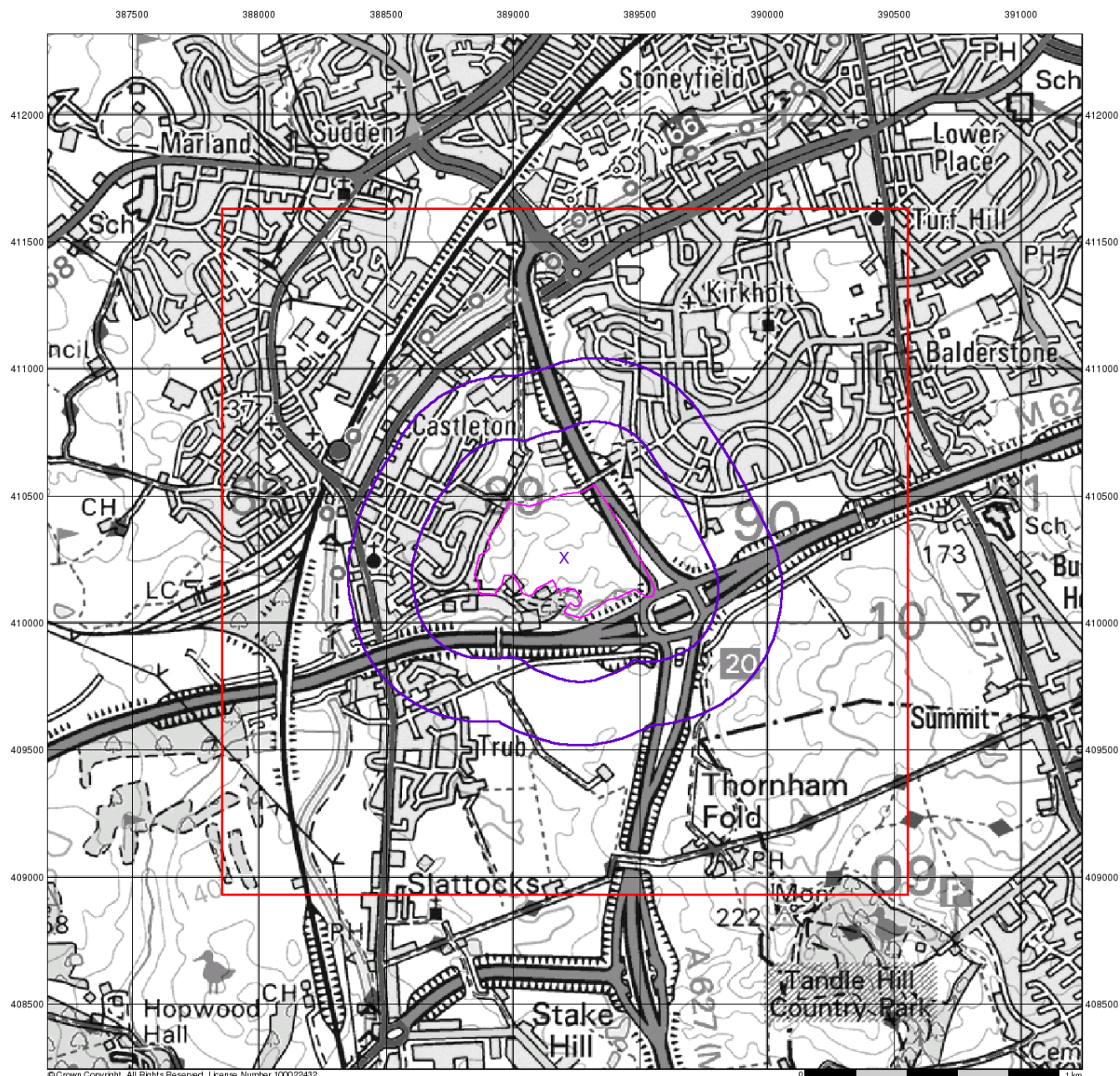
### Site Details

Site at 389190, 410260



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## Source Protection Zones

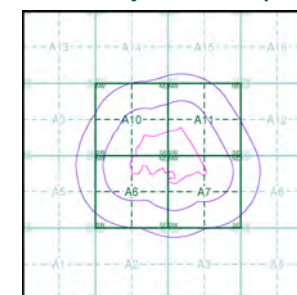
### General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- 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)
- Source Protection Zone Borehole

### Site Sensitivity Context Map - Slice A



### Order Details

Order Number: 77317590\_1\_1  
 Customer Ref: R2228  
 National Grid Reference: 389200, 410260  
 Slice: A  
 Site Area (Ha): 21.43  
 Search Buffer (m): 500

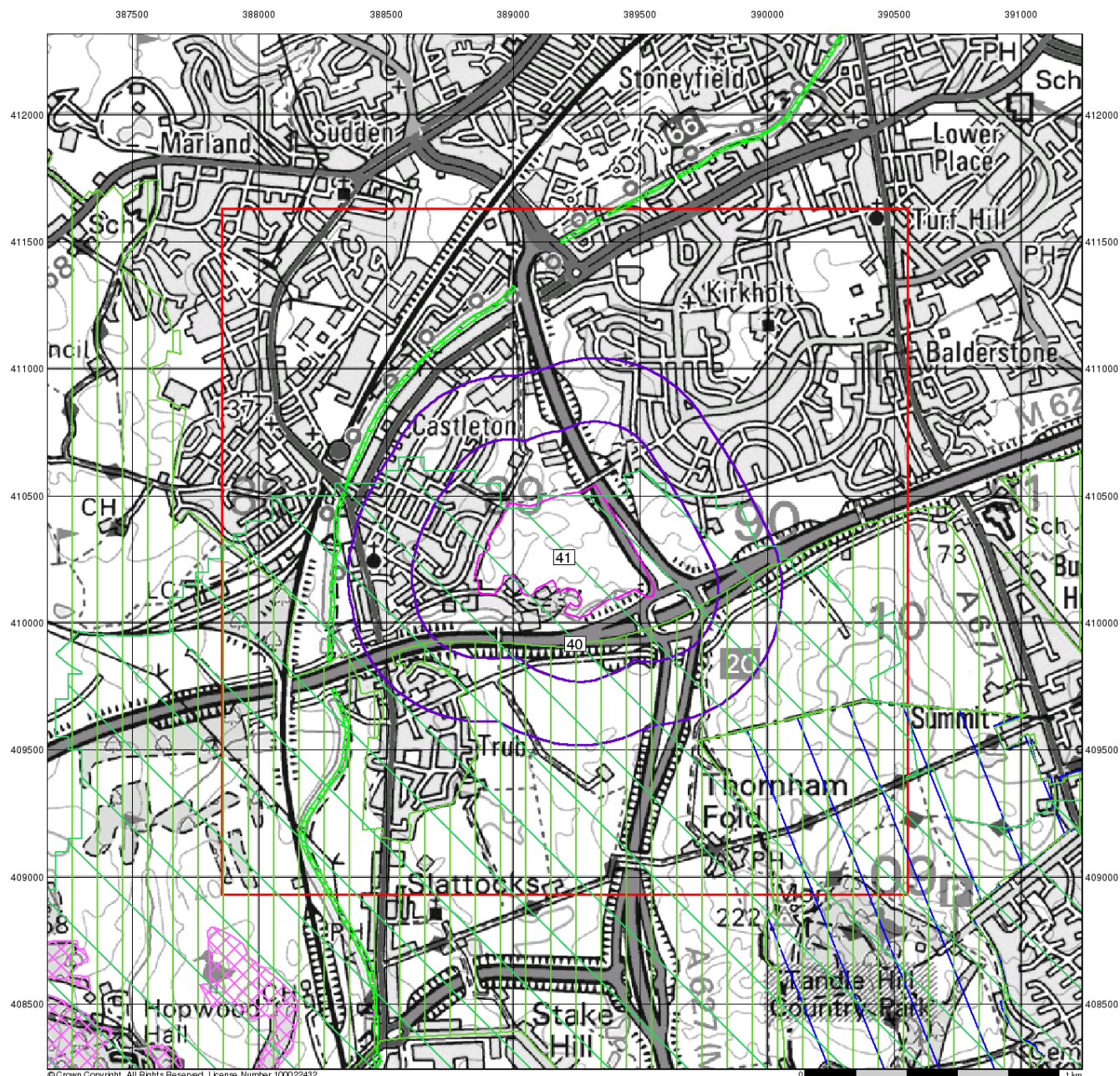
### Site Details

Site at 389190, 410260



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## Sensitive Land Uses

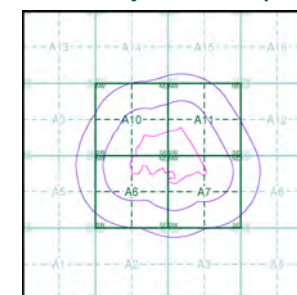
### General

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

### Sensitive Land Uses

- 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

### Site Sensitivity Context Map - Slice A



### Order Details

Order Number: 77317590\_1\_1  
 Customer Ref: R2228  
 National Grid Reference: 389200, 410260  
 Slice: A  
 Site Area (Ha): 21.43  
 Search Buffer (m): 500

### Site Details

Site at 389190, 410260



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



### General

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

### Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

### Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

### Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

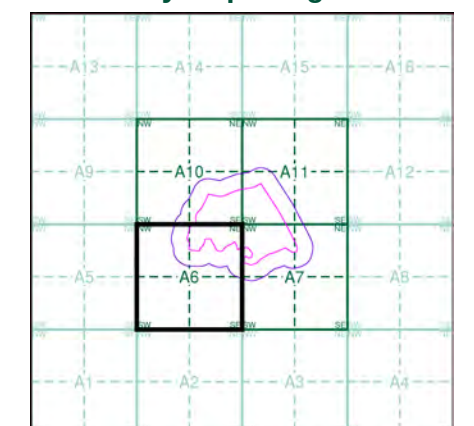
### Geological

- BGS Recorded Mineral Site

### Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry

### Site Sensitivity Map - Segment A6

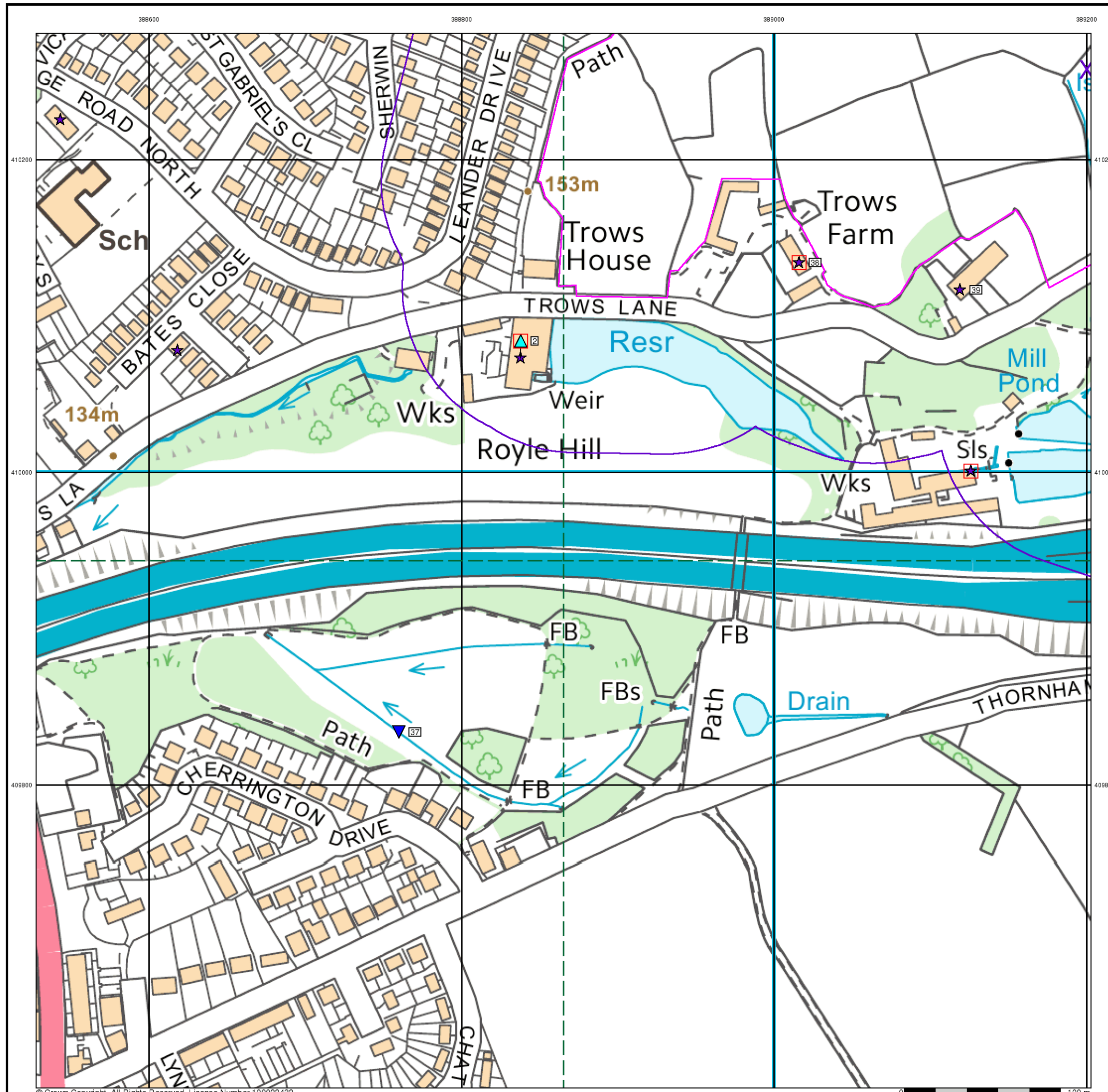


### Order Details

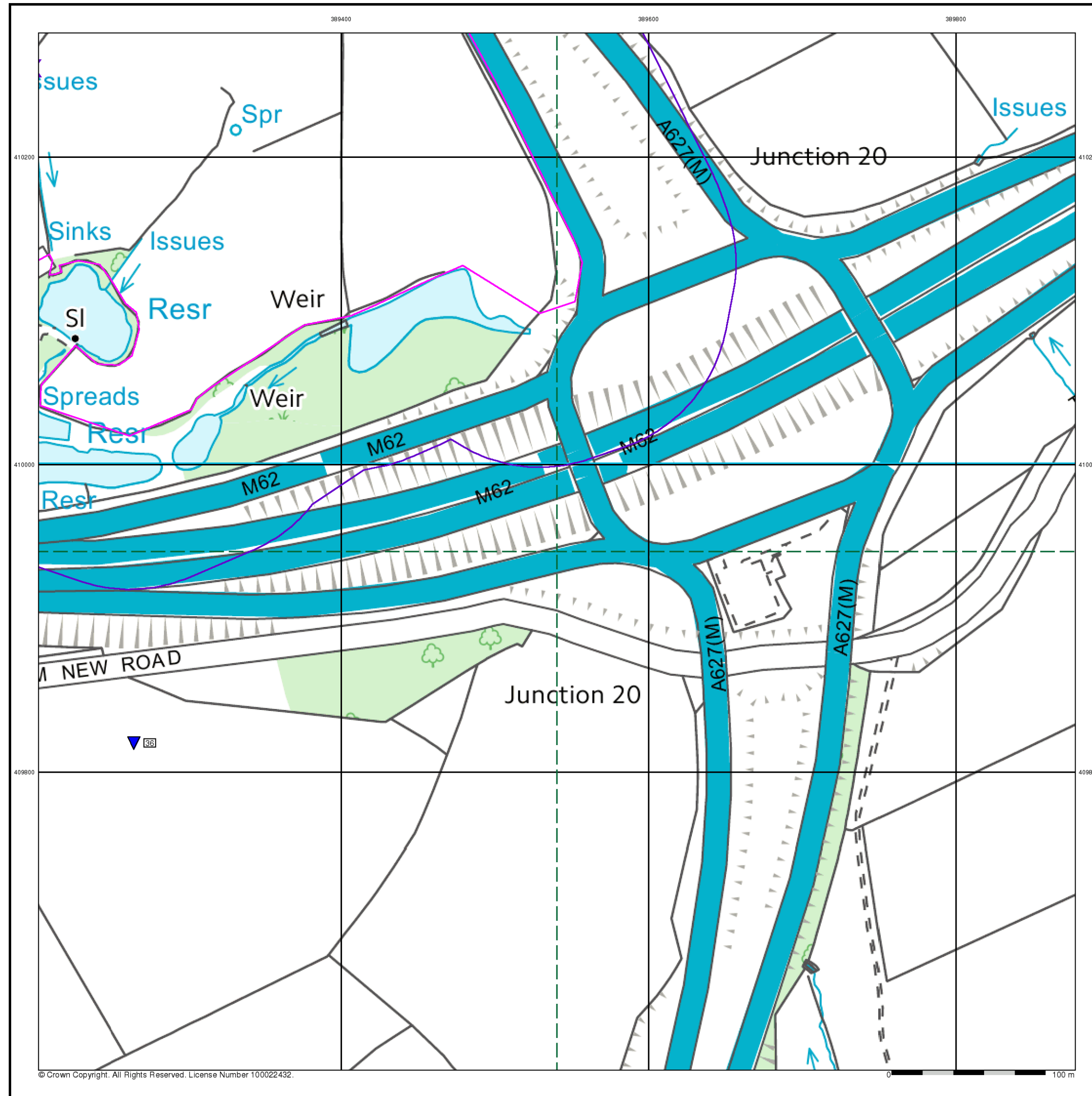
Order Number: 77317590\_1\_1  
 Customer Ref: R2228  
 National Grid Reference: 389200, 410260  
 Slice: A  
 Site Area (Ha): 21.43

### Site Details

Site at 389190, 410260





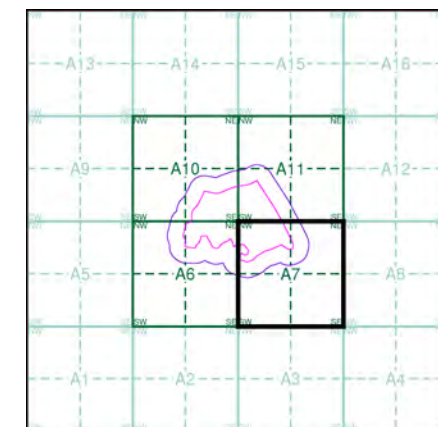


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- General**
  - Specified Site
  - Specified Buffer(s)
  - Bearing Reference Point
  - Map ID
  - Several of Type at Location
- Agency and Hydrological**
  - Contaminated Land Register Entry or Notice (Location)
  - Contaminated Land Register Entry or Notice
  - Discharge Consent
  - Enforcement or Prohibition Notice
  - Integrated Pollution Control
  - Integrated Pollution Prevention Control
  - Local Authority Integrated Pollution Prevention and Control
  - Local Authority Pollution Prevention and Control
  - Local Authority Pollution Prevention and Control Enforcement
  - Pollution Incident to Controlled Waters
  - Prosecution Relating to Authorised Processes
  - Prosecution Relating to Controlled Waters
  - Registered Radioactive Substance
  - River Network or Water Feature
  - River Quality Sampling Point
  - Substantiated Pollution Incident Register
  - Water Abstraction
  - Water Industry Act Referral
- Waste**
  - BGS Recorded Landfill Site (Location)
  - BGS Recorded Landfill Site
  - EA Historic Landfill (Buffered Point)
  - EA Historic Landfill (Polygon)
  - Integrated Pollution Control Registered Waste Site
  - Licensed Waste Management Facility (Landfill Boundary)
  - Licensed Waste Management Facility (Location)
  - Local Authority Recorded Landfill Site (Location)
  - Local Authority Recorded Landfill Site
  - Registered Landfill Site
  - Registered Landfill Site (Location)
  - Registered Landfill Site (Point Buffered to 100m)
  - Registered Landfill Site (Point Buffered to 250m)
  - Registered Waste Transfer Site (Location)
  - Registered Waste Transfer Site
  - Registered Waste Treatment or Disposal Site (Location)
  - Registered Waste Treatment or Disposal Site
- Hazardous Substances**
  - COMAH Site
  - Explosive Site
  - NIHHS Site
  - Planning Hazardous Substance Consent
  - Planning Hazardous Substance Enforcement
- Geological**
  - BGS Recorded Mineral Site
- Industrial Land Use**
  - Contemporary Trade Directory Entry
  - Fuel Station Entry

Site Sensitivity Map - Segment A7



**Order Details**  
Order Number: 77317590\_1\_1  
Customer Ref: R2228  
National Grid Reference: 389200, 410260  
Slice: A  
Site Area (Ha): 21.43

**Site Details**  
Site at 389190, 410260



### General

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

### Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

### Waste

- BGS Recorded Landfill Site (Location)
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- EA Historic Landfill (Polygon)
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- Licensed Waste Management Facility (Landfill Boundary)
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- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

### Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

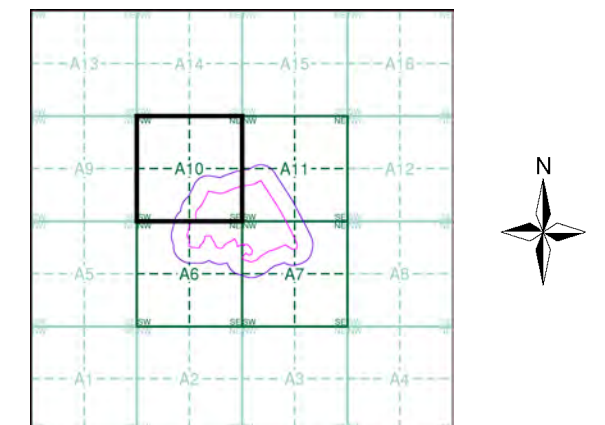
### Geological

- BGS Recorded Mineral Site

### Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry

### Site Sensitivity Map - Segment A10

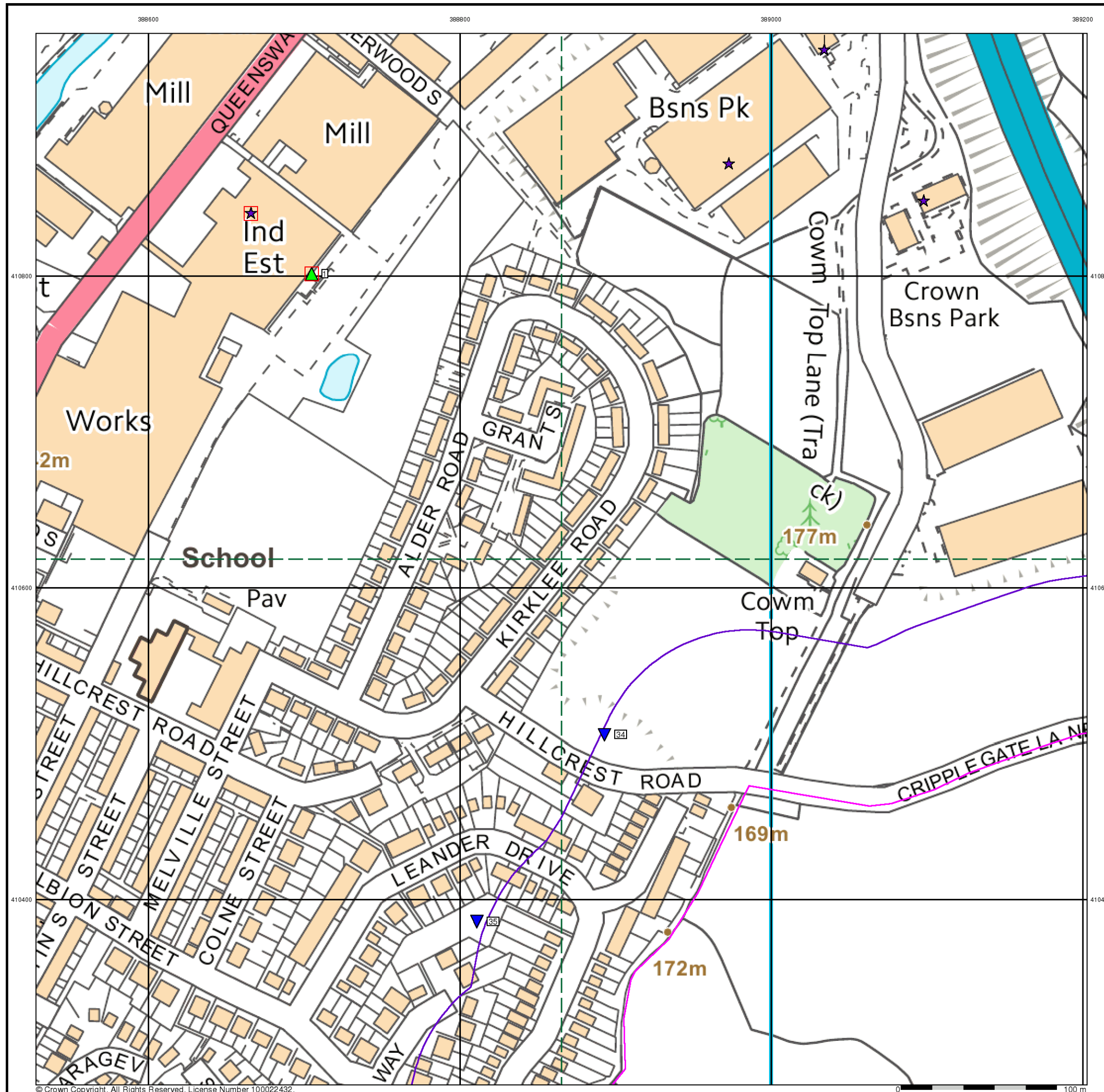


### Order Details

Order Number: 77317590\_1\_1  
 Customer Ref: R2228  
 National Grid Reference: 389200, 410260  
 Slice: A  
 Site Area (Ha): 21.43

### Site Details

Site at 389190, 410260





### General

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

### Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

### Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

### Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

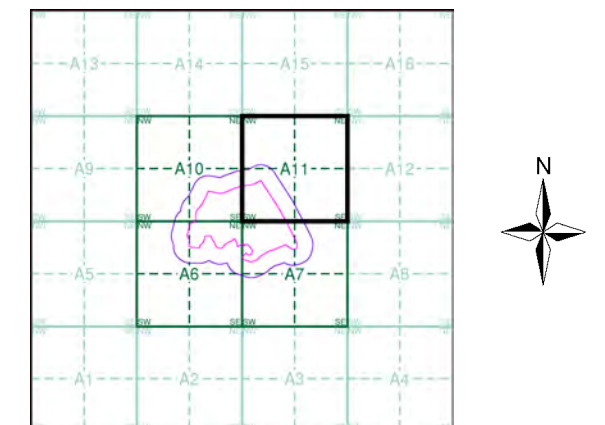
### Geological

- BGS Recorded Mineral Site

### Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry

### Site Sensitivity Map - Segment A11

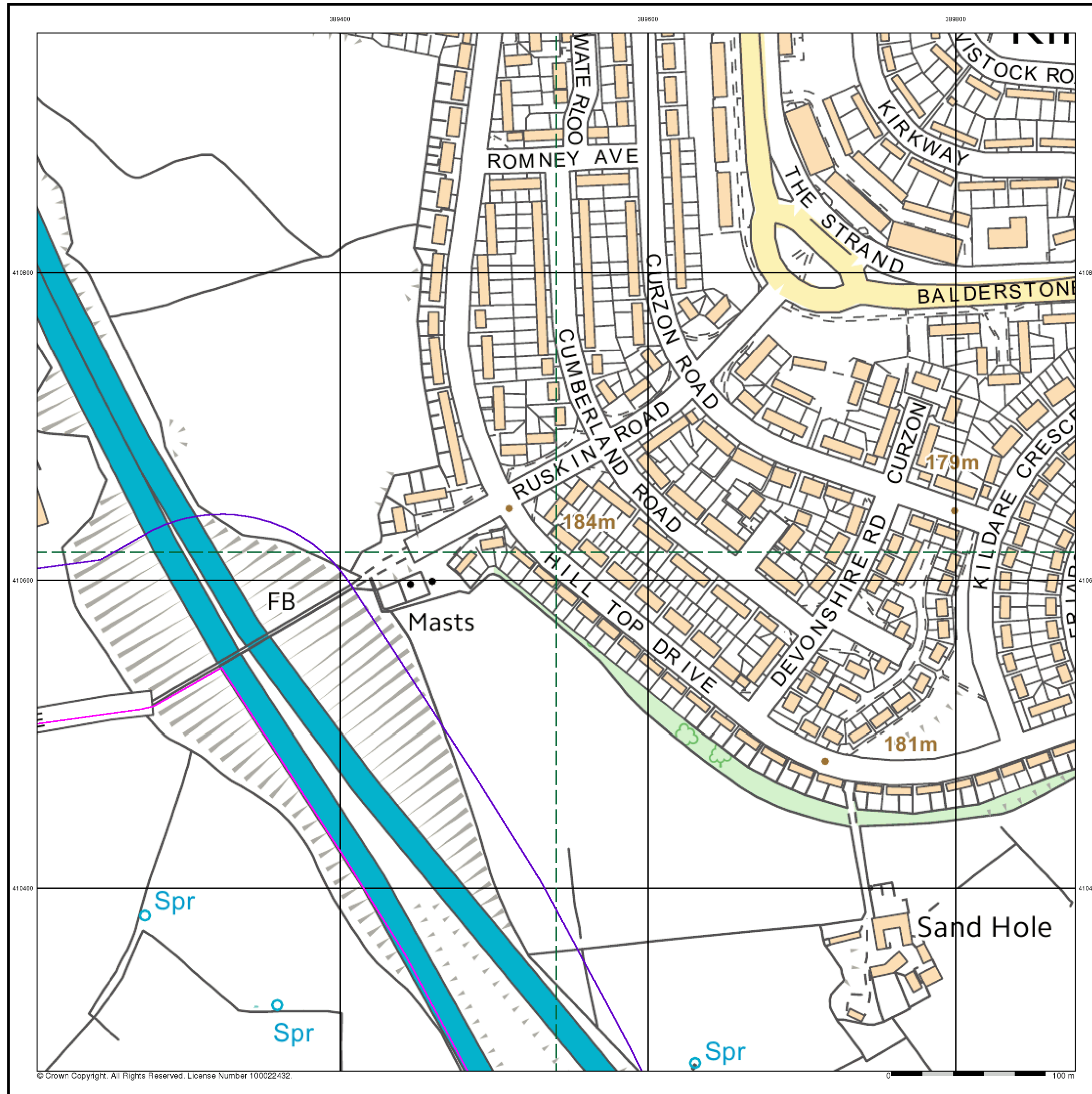


### Order Details

Order Number: 77317590\_1\_1  
 Customer Ref: R2228  
 National Grid Reference: 389200, 410260  
 Slice: A  
 Site Area (Ha): 21.43

### Site Details

Site at 389190, 410260





## General

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

## Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

## Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

## Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

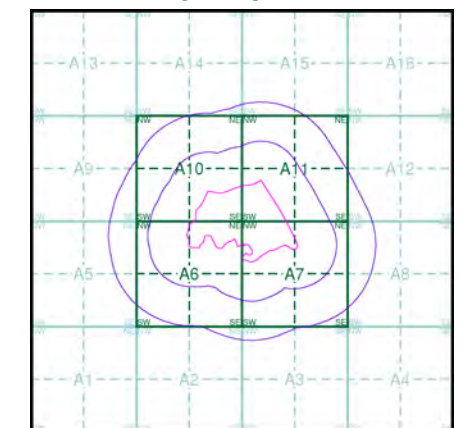
## Geological

- BGS Recorded Mineral Site

## Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry

## Site Sensitivity Map - Slice A



## Order Details

Order Number: 77317590\_1\_1  
 Customer Ref: R2228  
 National Grid Reference: 389200, 410260  
 Slice: A  
 Site Area (Ha): 21.43  
 Search Buffer (m): 500

## Site Details

Site at 389190, 410260





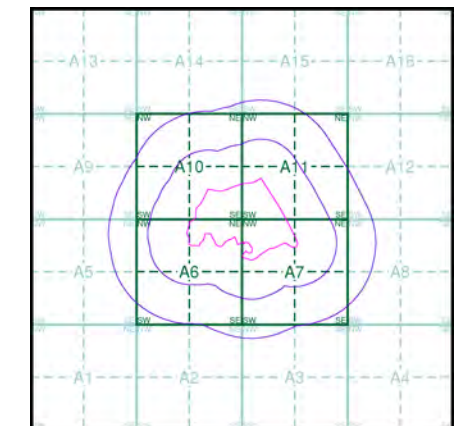
### General

-  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: 77317590\_1\_1  
 Customer Ref: R2228  
 National Grid Reference: 389200, 410260  
 Slice: A  
 Site Area (Ha): 21.43  
 Search Buffer (m): 500

### Site Details

Site at 389190, 410260





### General

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

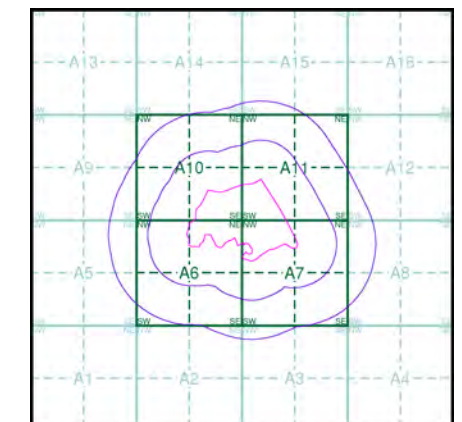
### Agency and Hydrological (Boreholes)

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

For Borehole information please refer to the Borehole datasheet 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](http://www.envirocheck.co.uk).

### Borehole Map - Slice A



### Order Details

Order Number: 77317590\_1\_1  
 Customer Ref: R2228  
 National Grid Reference: 389200, 410260  
 Slice: A  
 Site Area (Ha): 21.43  
 Search Buffer (m): 500

### Site Details

Site at 389190, 410260





## General

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

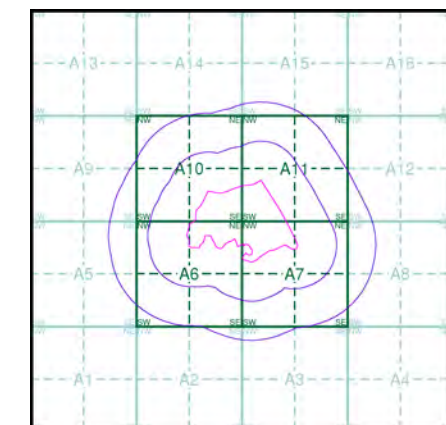
## Detailed River Network Data

- |                                                                                                              |                                                                                                                         |
|--------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
|  Primary River            |  Extended Culvert (greater than 50m) |
|  Secondary River          |  Underground River (inferred)        |
|  Tertiary River           |  Underground River (local knowledge) |
|  Canal                    |  Downstream of High Water Mark       |
|  Canal Tunnel             |  Downstream of Seaward Extension     |
|  Undefined River          |  Not assigned River feature          |
|  Lake/Reservoir           |                                                                                                                         |
|  Offline Drainage Feature |                                                                                                                         |

## Contours (height in metres)

- Standard Contour  105  MLW Mean Low Water
- Master Contour  100  MHW Mean High Water
- Spot Height  \*167.3

## EA/NRW Detailed River Network Map - Slice A

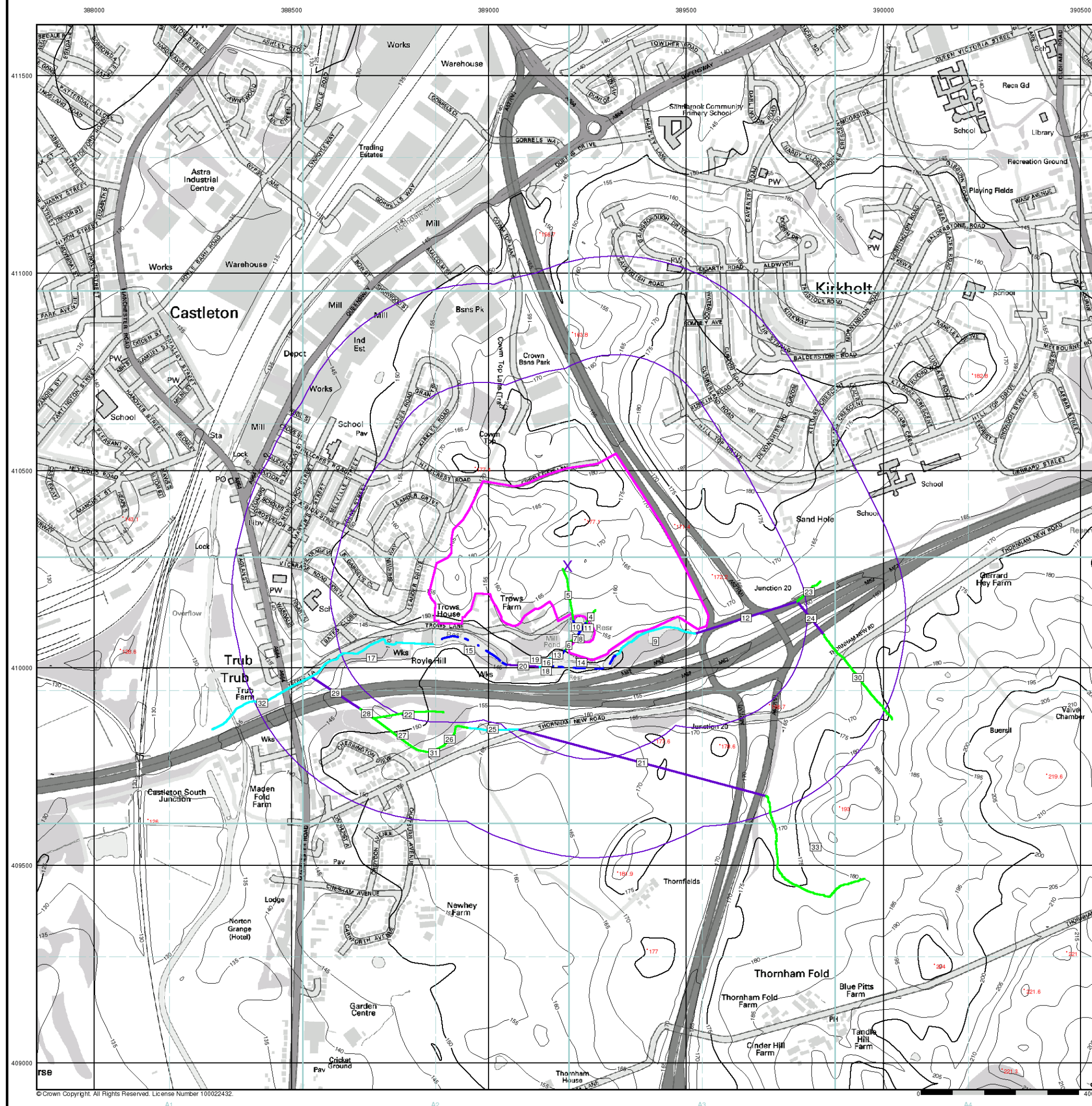


## Order Details

Order Number: 77317590\_1\_1  
 Customer Ref: R2228  
 National Grid Reference: 389200, 410260  
 Slice: A  
 Site Area (Ha): 21.43  
 Search Buffer (m): 500

## Site Details

Site at 389190, 410260





### General

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

### Risk of Flooding from Surface Water

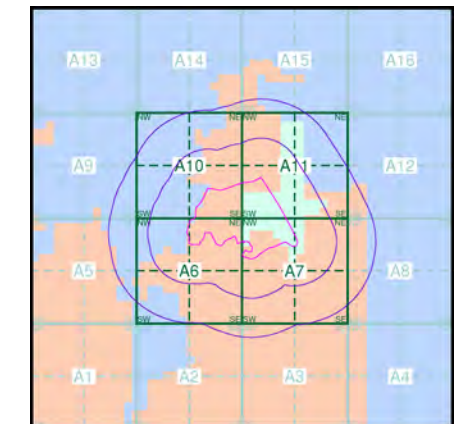
- High - 30 Year Return
- Medium - 100 Year Return
- Low - 1000 Year Return

### Suitability

See the suitability map below

- National to county
- County to town
- Town to street
- Street to parcels of land
- Property

### EA/NRW Suitability Map - Slice A

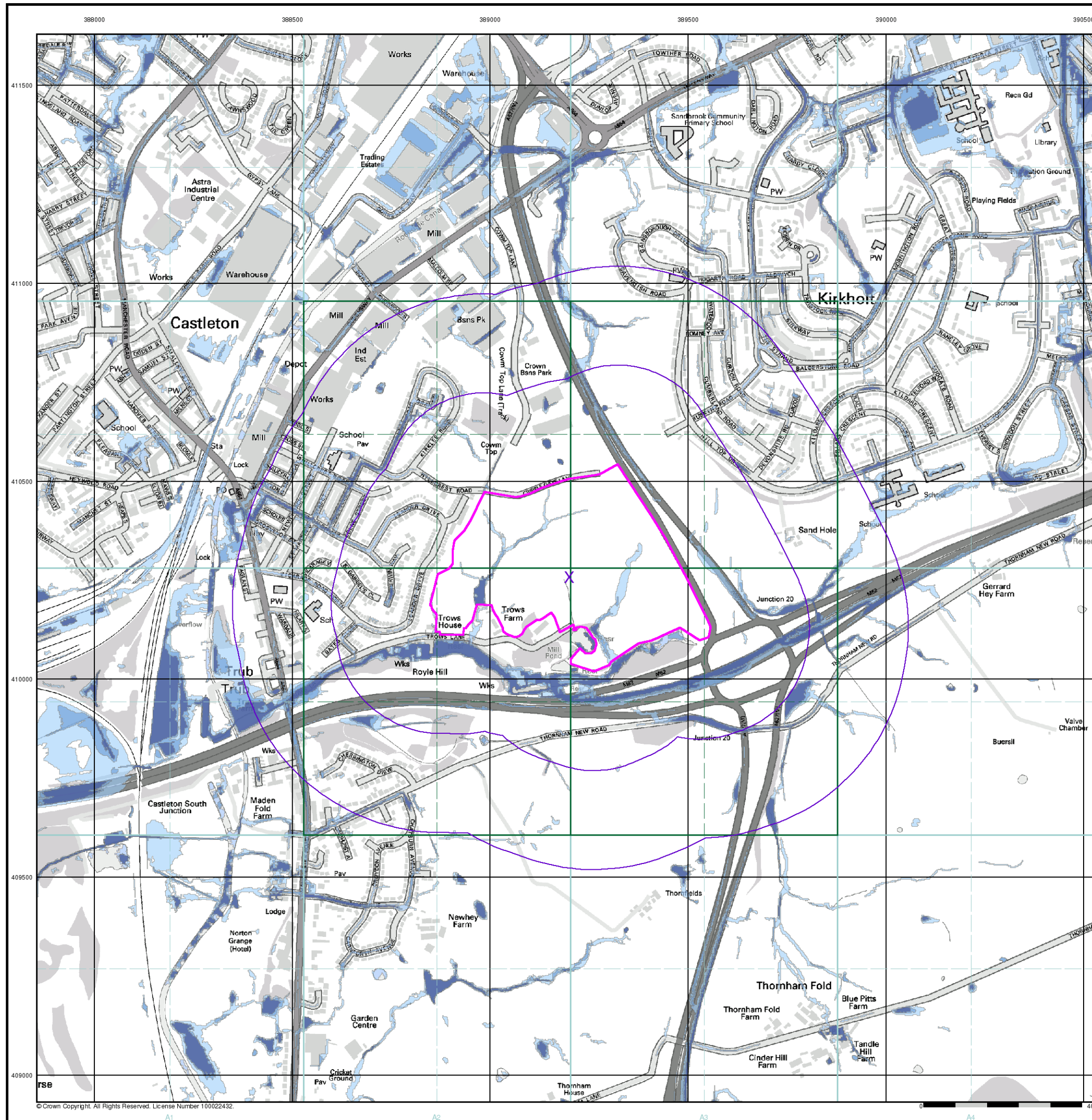


### Order Details

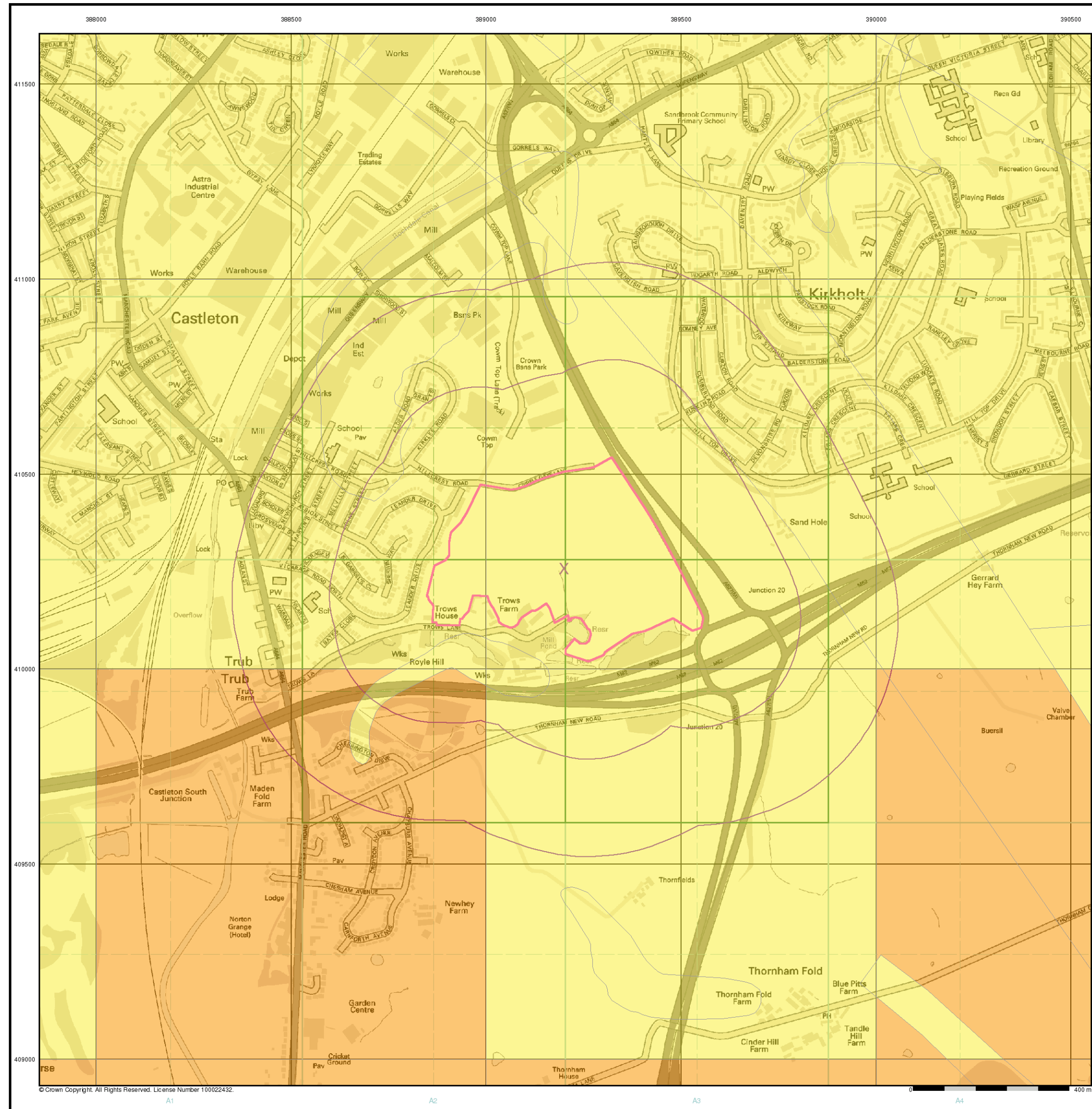
Order Number: 77317590\_1\_1  
 Customer Ref: R2228  
 National Grid Reference: 389200, 410260  
 Slice: A  
 Site Area (Ha): 21.43  
 Search Buffer (m): 500

### Site Details

Site at 389190, 410260







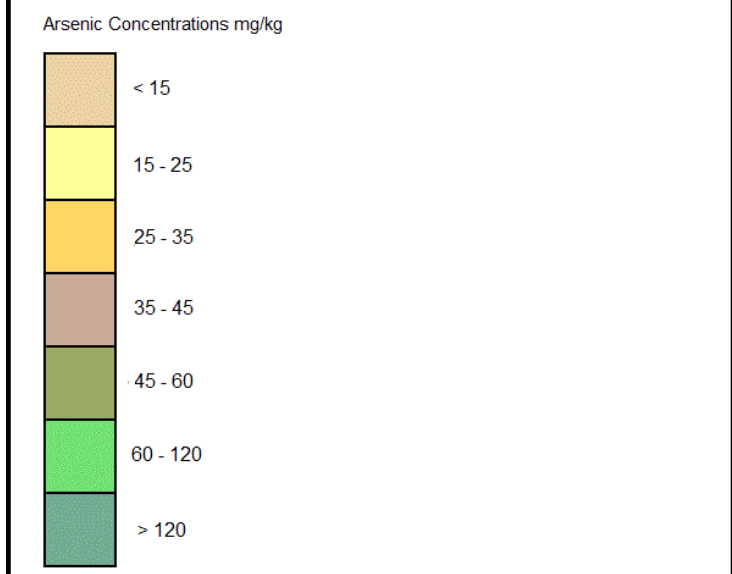
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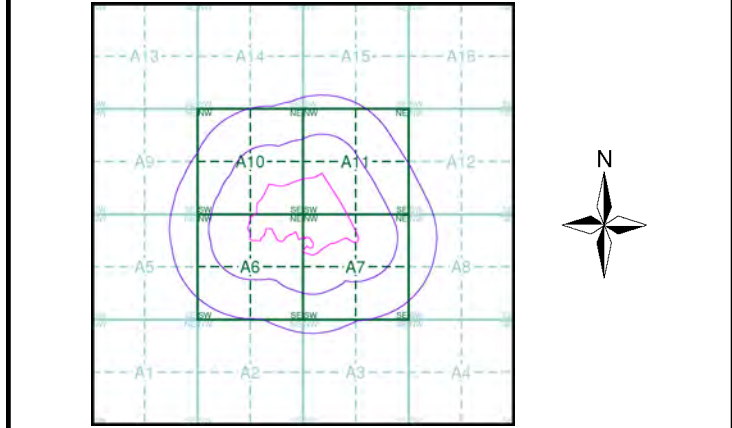
**General**

Specified Site      Specified Buffer(s)      Bearing Reference Point

**Estimated Soil Chemistry Arsenic**



**Estimated Soil Chemistry Arsenic - Slice A**



**Order Details**

Order Details: 77317590\_1\_1  
Customer Ref: R2228  
National Grid Reference: 389200, 410260  
Slice: A  
Site Area (Ha): 21.43  
Search Buffer (m): 500

**Site Details**

Site at 389190, 410260



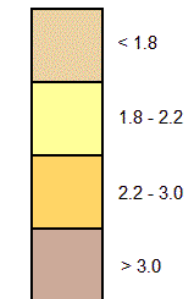


## General

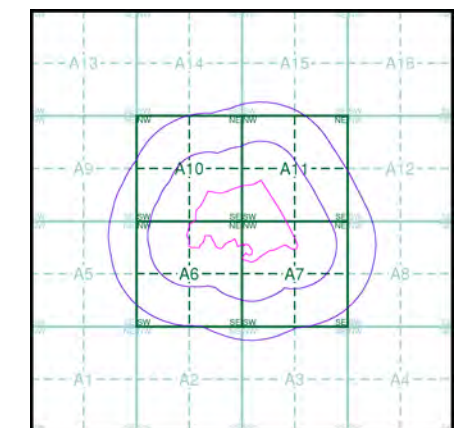
○ Specified Site    
 ○ Specified Buffer(s)    
 X Bearing Reference Point

## Estimated Soil Chemistry Cadmium

Cadmium Concentrations mg/kg



## Estimated Soil Chemistry Cadmium - Slice A

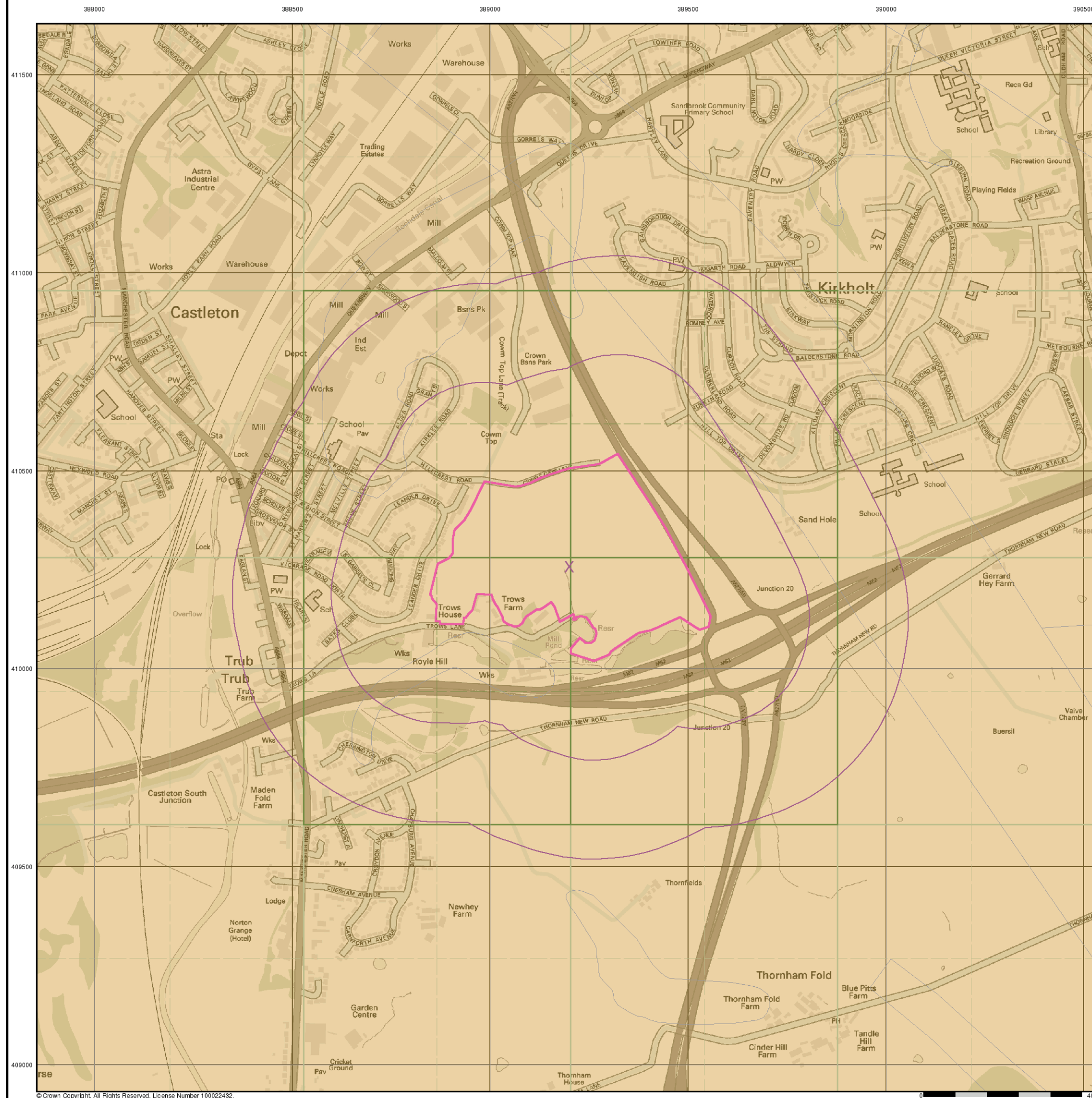


## Order Details

Order Details: 77317590\_1\_1  
 Customer Ref: R2228  
 National Grid Reference: 389200, 410260  
 Slice: A  
 Site Area (Ha): 21.43  
 Search Buffer (m): 500

## Site Details

Site at 389190, 410260



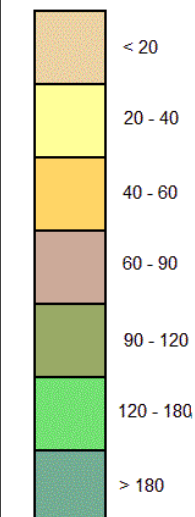


## General

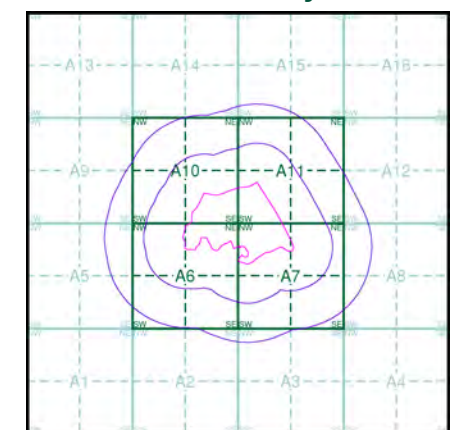
 Specified Site
  Specified Buffer(s)
  Bearing Reference Point

## Estimated Soil Chemistry Chromium

Chromium Concentrations mg/kg



## Estimated Soil Chemistry Chromium - Slice A



## Order Details

Order Details: 77317590\_1\_1  
 Customer Ref: R2228  
 National Grid Reference: 389200, 410260  
 Slice: A  
 Site Area (Ha): 21.43  
 Search Buffer (m): 500

## Site Details

Site at 389190, 410260



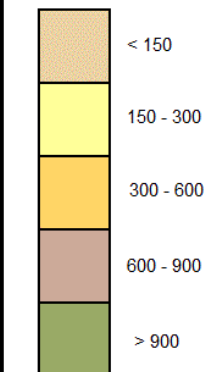


## General

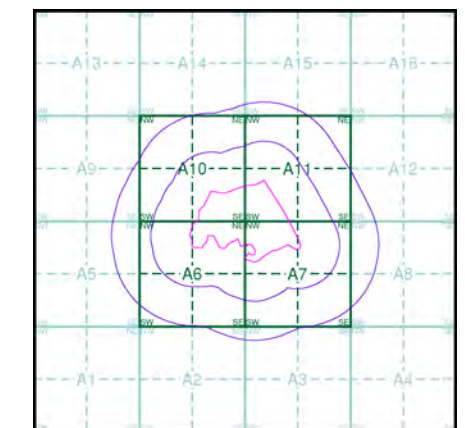
 Specified Site
  Specified Buffer(s)
  Bearing Reference Point

## Estimated Soil Chemistry Lead

Lead Concentrations mg/kg



## Estimated Soil Chemistry Lead - Slice A

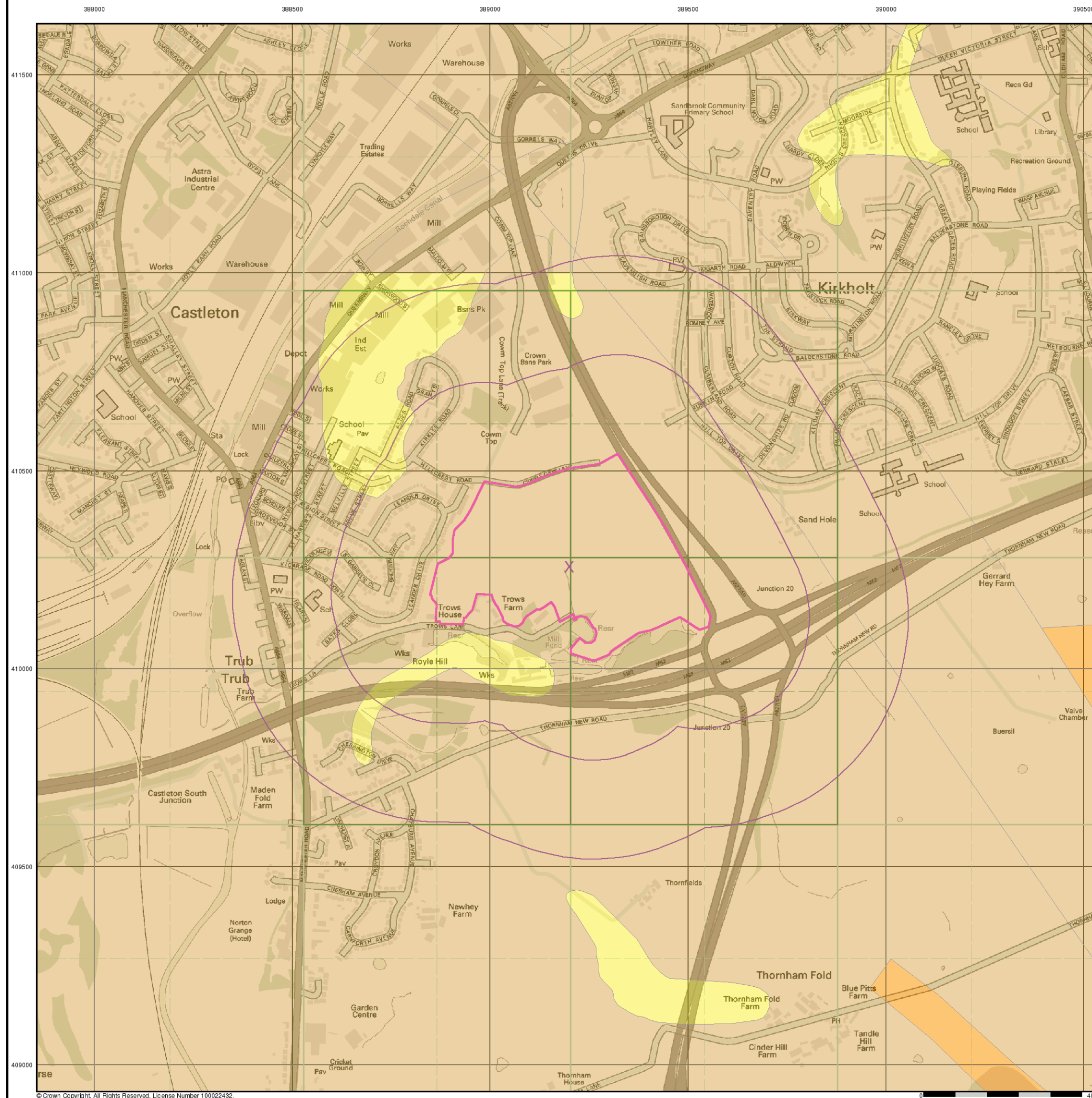


## Order Details

Order Details: 77317590\_1\_1  
 Customer Ref: R2228  
 National Grid Reference: 389200, 410260  
 Slice: A  
 Site Area (Ha): 21.43  
 Search Buffer (m): 500

## Site Details

Site at 389190, 410260





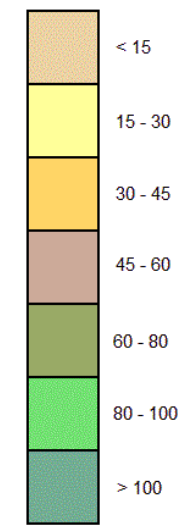


General

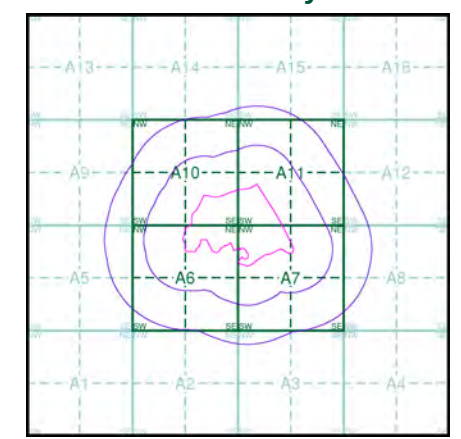
- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

Estimated Soil Chemistry Nickel

Nickel Concentrations mg/kg



Estimated Soil Chemistry Nickel - Slice A



Order Details

Order Details: 77317590\_1\_1  
Customer Ref: R2228  
National Grid Reference: 389200, 410260  
Slice: A  
Site Area (Ha): 21.43  
Search Buffer (m): 500

Site Details

Site at 389190, 410260



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

## Envirocheck<sup>®</sup> Report:

### BGS Boreholes Datasheet

#### Order Details:

**Order Number:**

77317590\_1\_1

**Customer Reference:**

R2228

**National Grid Reference:**

389200, 410260

**Slice:**

A

**Site Area (Ha):**

21.43

**Borehole Search Buffer (m):**

50

#### Site Details:

Site at 389190, 410260

#### Client Details:

Mr S Miller  
Smith Grant Partnership  
Station House  
Station Road  
Ruabon  
Wrexham  
LL14 6DL



| <b>Data Type</b>    | <b>Page Number</b> | <b>On Site</b> | <b>0 to 50m</b> |
|---------------------|--------------------|----------------|-----------------|
| BGS Boreholes (50m) | pg 1               | None           | 3               |

**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 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 the attached 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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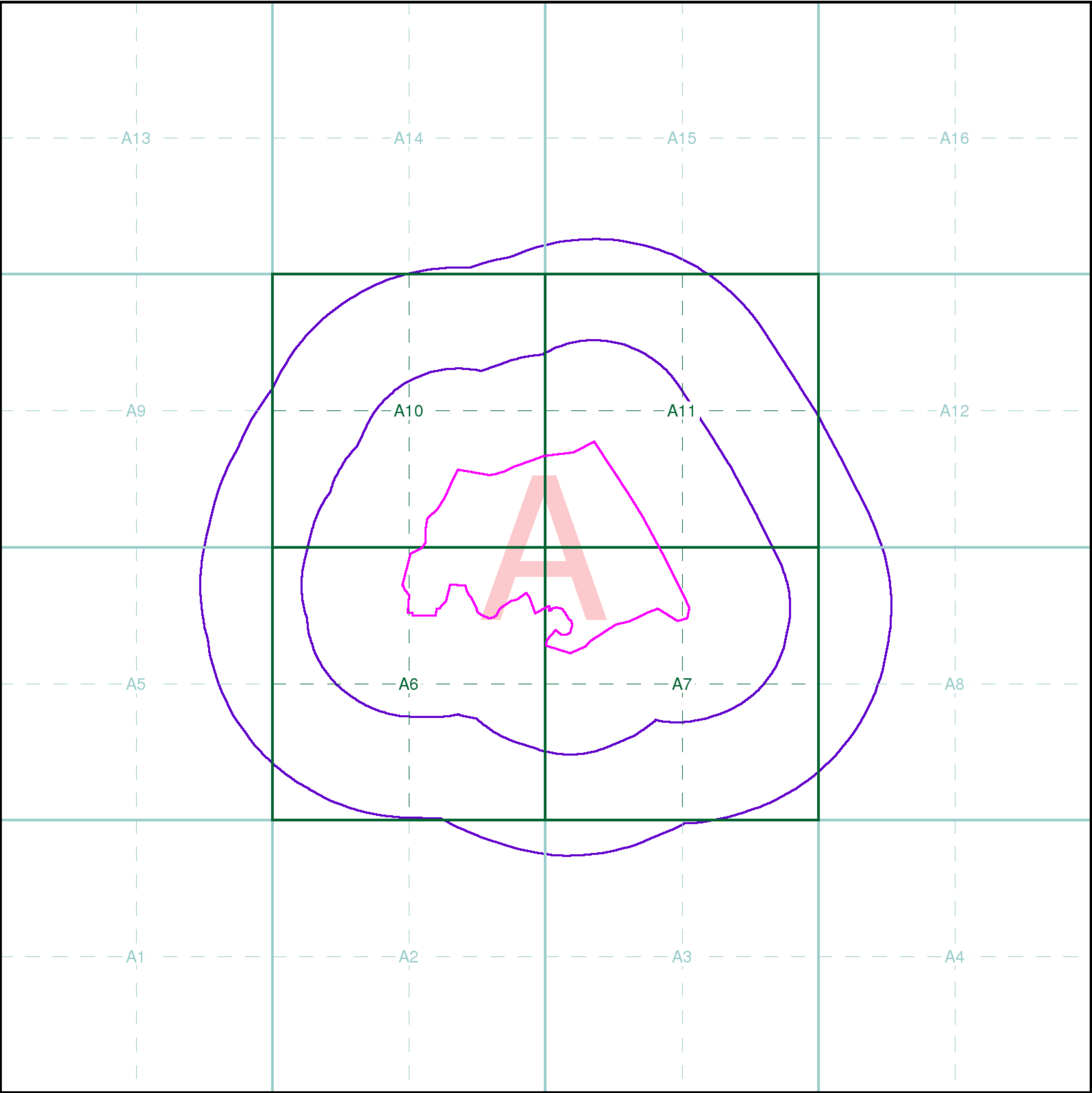
A copy of the BGS Borehole Ordering Form is available to download from the Support section of [www.envirocheck.co.uk](http://www.envirocheck.co.uk).

**Report Version v50.0**

| Map ID | Details                                                                                                                                                                                                                                                                      | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR              |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|------------------|
| 42     | <b>BGS Boreholes</b><br>BGS Reference: Sd81se421<br>Drilled Length (m): 8<br>Borehole Name: Junction 20 Project Rochdale 1<br>Link to Borehole Scan: <a href="http://scans.bgs.ac.uk/sobi_scans/boreholes/30147/">http://scans.bgs.ac.uk/sobi_scans/boreholes/30147/</a>     | A10SE (NW)                             | 20                           | 4       | 389100<br>410490 |
| 43     | <b>BGS Boreholes</b><br>BGS Reference: Sd81se423<br>Drilled Length (m): 12<br>Borehole Name: Junction 20 Project Rochdale 3<br>Link to Borehole Scan: <a href="http://scans.bgs.ac.uk/sobi_scans/boreholes/30149/">http://scans.bgs.ac.uk/sobi_scans/boreholes/30149/</a>    | A11SW (N)                              | 41                           | 4       | 389220<br>410550 |
| 44     | <b>BGS Boreholes</b><br>BGS Reference: Sd81se429<br>Drilled Length (m): 3.9<br>Borehole Name: Junction 20 Project Rochdale Tp1<br>Link to Borehole Scan: <a href="http://scans.bgs.ac.uk/sobi_scans/boreholes/30155/">http://scans.bgs.ac.uk/sobi_scans/boreholes/30155/</a> | A10SE (NW)                             | 46                           | 4       | 389040<br>410510 |

| BGS Boreholes                                                                               | Version       | Update Cycle |
|---------------------------------------------------------------------------------------------|---------------|--------------|
| <b>BGS Boreholes</b><br>British Geological Survey - National Geoscience Information Service | November 2015 | Quarterly    |

| Contact Details                                                                                                                                                                                                                                                                                                                                  | Contact Logo                                                                                                                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>4 British Geological Survey - Enquiry Service</b><br>British Geological Survey, Kingsley Dunham Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG<br>Telephone: 0115 936 3143<br>Fax: 0115 936 3276<br>Email: <a href="mailto:enquiries@bgs.ac.uk">enquiries@bgs.ac.uk</a><br>Website: <a href="http://www.bgs.ac.uk">www.bgs.ac.uk</a> |  <b>British Geological Survey</b><br>NATURAL ENVIRONMENT RESEARCH COUNCIL |
| <b>- Landmark Information Group Limited</b><br>Imperium, Imperial Way, Reading, Berkshire, RG2 0TD<br>Telephone: 0844 844 9952<br>Fax: 0844 844 9951<br>Email: <a href="mailto:customerservices@landmarkinfo.co.uk">customerservices@landmarkinfo.co.uk</a><br>Website: <a href="http://www.landmarkinfo.co.uk">www.landmarkinfo.co.uk</a>       |  <b>LANDMARK<sup>®</sup></b><br>Information Group                         |



### Index Map

For ease of identification, your site and buffer have been split into Slices, Segments and Quadrants. These are illustrated on the Index Map opposite and explained further below.

**Slice**  
Each slice represents a 1:10,000 plot area (2.7km x 2.7km) for your site and buffer. A large site and buffer may be made up of several slices (represented by a red outline), that are referenced by letters of the alphabet, starting from the bottom left corner of the slice "grid". This grid does not relate to National Grid lines but is designed to give best fit over the site and buffer.

**Segment**  
A segment represents a 1:2,500 plot area. Segments that have plot files associated with them are shown in dark green, others in light blue. These are numbered from the bottom left hand corner within each slice.

**Quadrant**  
A quadrant is a quarter of a segment. These are labelled as NW, NE, SW, SE and are referenced in the datasheet to allow features to be quickly located on plots. Therefore a feature that has a quadrant reference of A7NW will be in Slice A, Segment 7 and the NW Quadrant.

A selection of organisations who provide data within this report:



Envirocheck reports are compiled from 136 different sources of data.

**Client Details**  
Mr S Miller, Smith Grant Partnership, Station House,  
Station Road, Ruabon, Wrexham, LL14 6DL

**Order Details**  
Order Number: 77317590\_1\_1  
Customer Ref: R2228  
National Grid Reference: 389200, 410280  
Site Area (Ha): 21.43  
Search Buffer (m): 500

**Site Details**  
Site at 389190, 410260

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





## **APPENDIX C**

### **Ground Stability Report**

## Envirocheck<sup>®</sup> Report:

### Mining and Ground Stability Datasheet

#### Order Details:

**Order Number:**

77317590\_1\_1

**Customer Reference:**

R2228

**National Grid Reference:**

389200, 410260

**Slice:**

A

**Site Area (Ha):**

21.43

**Search Buffer (m):**

500

#### Site Details:

Site at 389190, 410260

#### Client Details:

Mr S Miller  
Smith Grant Partnership  
Station House  
Station Road  
Ruabon  
Wrexham  
LL14 6DL

| Report Section and Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Page Number |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| <b>Summary</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -           |
| <p>The Summary section provides an overview of the data contained within the report, detailing the number of data set features or the existence of a data set in relation to the buffer selected.</p> <p>For ease of reference, the report is broken down into 4 sections of data; Mining and Natural Cavities Data, Historical Land Use Information (1:2,500), Historical Land Use Information (1:10,000) and Ground Stability Data (1:50,000).</p>                                                                                                                                                                                                                              |             |
| <b>Mining and Natural Cavities Data</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>1</b>    |
| <p>The Mining and Natural Cavities Data section features data sets related to the existence of mining areas and their potential hazards; and details of naturally formed cavities.</p> <p>Data sets within this section are not plotted, with the exception of BGS Recorded Mineral Sites and Potential Mining Areas which feature on the Historical Land Use Information (1:10,000) map.</p>                                                                                                                                                                                                                                                                                     |             |
| <b>Historical Land Use Information (1:2,500)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>2</b>    |
| <p>The Historical Land Use Information (1:2,500) section contains data captured from analysis carried out by Landmark of 1:1,250 and 1:2,500 scale historical Ordnance Survey mapping, identifying areas where, historically, the land uses were potentially contaminative.</p> <p>For the purpose of this Envirocheck module, only historical data relating to mining and ground stability has been included and plotted on the corresponding Historical Land Use Information (1:2,500) map. This section also includes the Subterranean Features data set, which details various man-made and man-used underground spaces obtained from the Subterranea Britannica society.</p> |             |
| <b>Historical Land Use Information (1:10,000)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>6</b>    |
| <p>The Historical Land Use (1:10,000) section covers data captured from the systematic analysis carried out by Landmark of 1:10, 560 and 1:10,000 scale historical Ordnance Survey mapping dating back to the mid-19th century, identifying potentially contaminative past industrial land uses.</p> <p>For the purpose of this Envirocheck module, only data relating to mining and ground stability has been included and plotted on the accompanying Historical Land Use Information (1:10,000) map.</p>                                                                                                                                                                       |             |
| <b>Ground Stability Data (1:50,000)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>7</b>    |
| <p>The Ground Stability (1:50,000) section includes the BGS Geosure data suite, reporting features to 250m and plotted onto 3 separate maps. Also reported is brine subsidence, brine mining and salt mining data sets, of which Brine Pumping and Salt Mining Related Features are plotted, and subsidence insurance claims and insurance investigations data, which is not plotted.</p>                                                                                                                                                                                                                                                                                         |             |
| <b>Motion Map Data (1:2,500)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>9</b>    |
| <p>The Motion Map Data (1:2,500) section contains data which is plotted to indicate long-term stability trends from analysis of satellite radar data.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |
| <b>Historical Map List</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>10</b>   |
| <p>The Historical Map List section details the historical mapping that has been analysed for your site, in relation to the Historical Land Use Information sections.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |
| <b>Data Currency</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>12</b>   |
| <b>Data Suppliers</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>14</b>   |
| <b>Useful Contacts</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>15</b>   |

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The brine subsidence data relating to the Driotwich area as provided in this report is derived from JPB studies and physical monitoring undertaken annually over more than 35 years. For more detailed interpretation contact enquiries@jpb.co.uk. JPB retain the copyright and intellectual rights to this data and accept no liability for any loss or damage, including in direct or consequential loss, arising from the use of this data.





| Data Type                                                            | Page Number | On Site | 0 to 250m | 251 to 500m |
|----------------------------------------------------------------------|-------------|---------|-----------|-------------|
| <b>Mining and Natural Cavities Data</b>                              |             |         |           |             |
| BGS Recorded Mineral Sites                                           | pg 1        |         | 3         | 1           |
| Coal Mining Affected Areas                                           | pg 1        | Yes     | n/a       | n/a         |
| Man Made Mining Cavities                                             |             |         |           |             |
| Mining Instability                                                   | pg 1        | Yes     | n/a       | n/a         |
| Natural Cavities                                                     |             |         |           |             |
| Non Coal Mining Areas of Great Britain                               |             |         |           | n/a         |
| Potential Mining Areas                                               |             |         |           |             |
| <b>Historical Land Use Information (1:2,500)</b>                     |             |         |           |             |
| Extractive Industries or Potential Excavations from 1855-1909 (100m) | pg 2        | 1       | 4         | n/a         |
| Extractive Industries or Potential Excavations from 1893-1915 (100m) | pg 2        | 2       | 6         | n/a         |
| Extractive Industries or Potential Excavations from 1906-1937 (100m) | pg 3        | 1       | 7         | n/a         |
| Extractive Industries or Potential Excavations from 1924-1949 (100m) | pg 3        | 1       | 6         | n/a         |
| Extractive Industries or Potential Excavations from 1950-1980 (100m) | pg 4        |         | 7         | n/a         |
| Subterranean Features (100m)                                         |             |         |           | n/a         |
| <b>Historical Land Use Information (1:10,000)</b>                    |             |         |           |             |
| Air Shafts                                                           |             |         |           |             |
| Disturbed Ground                                                     |             |         |           |             |
| General Quarrying                                                    |             |         |           |             |
| Heap, unknown constituents                                           |             |         |           |             |
| Mineral Railway                                                      |             |         |           |             |
| Mining & quarrying general                                           |             |         |           |             |
| Mining of coal & lignite                                             |             |         |           |             |
| Quarrying of sand & clay, operation of sand & gravel pits            | pg 6        |         | 5         | 1           |
| Former Marshes                                                       | pg 6        |         | 1         |             |
| Potentially Infilled Land (Non-Water)                                | pg 6        |         | 5         | 2           |
| Potentially Infilled Land (Water)                                    | pg 6        |         | 2         | 4           |

| Data Type                                                         | Page Number | On Site | 0 to 250m | 251 to 500m |
|-------------------------------------------------------------------|-------------|---------|-----------|-------------|
| <b>Ground Stability Data (1:50,000)</b>                           |             |         |           |             |
| Brine Compensation Area                                           |             |         | n/a       | n/a         |
| Brine Pumping Related Features                                    |             |         |           |             |
| Brine Subsidence Solution Area                                    |             |         |           |             |
| Potential for Collapsible Ground Stability Hazards                | pg 7        | Yes     | Yes       | n/a         |
| Potential for Compressible Ground Stability Hazards               | pg 7        | Yes     | Yes       | n/a         |
| Potential for Ground Dissolution Stability Hazards                | pg 7        | Yes     | Yes       | n/a         |
| Potential for Landslide Ground Stability Hazards                  | pg 7        | Yes     | Yes       | n/a         |
| Potential for Running Sand Ground Stability Hazards               | pg 7        | Yes     | Yes       | n/a         |
| Potential for Shrinking or Swelling Clay Ground Stability Hazards | pg 7        | Yes     | Yes       | n/a         |
| Salt Mining Related Features                                      |             |         |           |             |
| Subsidence Insurance Claims                                       |             |         |           | n/a         |
| Subsidence Investigations                                         | pg 8        |         | 1         | n/a         |
| <b>Motion Map Data (1:2,500)</b>                                  |             |         |           |             |
| Motion Map (100m)                                                 | pg 9        |         | 19        | n/a         |

Report Version v50.0

| Map ID | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
| 1      | <b>BGS Recorded Mineral Sites</b><br>Site Name: Windy Bank Sand Pit<br>Location: , Castleton, Rochdale, Lancashire<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 96584<br>Type: Opencast<br><b>Status: Ceased</b><br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Glaciofluvial Deposits, Devensian<br>Commodity: Sand<br>Positional Accuracy: Located by supplier to within 10m | A10SE (NW)                             | 99                           | 1       | 388893 410507 |
| 2      | <b>BGS Recorded Mineral Sites</b><br>Site Name: Windy Bank Sand Pit<br>Location: , Castleton, Rochdale, Lancashire<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 96583<br>Type: Opencast<br><b>Status: Ceased</b><br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Glaciofluvial Deposits, Devensian<br>Commodity: Sand<br>Positional Accuracy: Located by supplier to within 10m | A10SW (W)                              | 107                          | 1       | 388811 410387 |
| 3      | <b>BGS Recorded Mineral Sites</b><br>Site Name: Castleton<br>Location: , Castleton, Rochdale, Lancashire<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 15322<br>Type: Opencast<br><b>Status: Ceased</b><br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Glaciofluvial Deposits, Devensian<br>Commodity: Sand<br>Positional Accuracy: Located by supplier to within 10m           | A7SW (S)                               | 199                          | 1       | 389265 409820 |
| 4      | <b>BGS Recorded Mineral Sites</b><br>Site Name: Castleton<br>Location: , Castleton, Rochdale, Lancashire<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 15321<br>Type: Opencast<br><b>Status: Ceased</b><br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Glaciofluvial Deposits, Devensian<br>Commodity: Sand<br>Positional Accuracy: Located by supplier to within 10m           | A6SW (SW)                              | 300                          | 1       | 388760 409835 |
|        | <b>Coal Mining Affected Areas</b><br>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.                                                                                                                                                                                                                     | A6NE (N)                               | 0                            | 2       | 389200 410258 |
|        | <b>Mining Instability</b><br>Mining Evidence: Inconclusive Coal Mining<br>Source: Ove Arup & Partners<br>Boundary Quality: As Supplied                                                                                                                                                                                                                                                                                                                                                       | A6NE (N)                               | 0                            | 3       | 389200 410258 |
|        | <b>Non Coal Mining Areas of Great Britain</b><br>No Hazard                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                              |         |               |

| Map ID | Details                                                                                                                                                                        | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR              |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|------------------|
| 5      | <b>Extractive Industries or Potential Excavations from 1855-1909</b><br>Use: Mill Pond<br>First Map Published 1893<br>Date:<br>Last Map Published Not Applicable<br>Date:      | A7NW (S)                               | 0                            | -       | 389209<br>410063 |
| 6      | <b>Extractive Industries or Potential Excavations from 1855-1909</b><br>Use: Reservoir<br>First Map Published 1890<br>Date:<br>Last Map Published Not Applicable<br>Date:      | A7NW (SE)                              | 1                            | -       | 389408<br>410096 |
| 7      | <b>Extractive Industries or Potential Excavations from 1855-1909</b><br>Use: Reservoir<br>First Map Published 1893<br>Date:<br>Last Map Published Not Applicable<br>Date:      | A6NE (S)                               | 11                           | -       | 389198<br>410012 |
| 8      | <b>Extractive Industries or Potential Excavations from 1855-1909</b><br>Use: Reservoir<br>First Map Published 1893<br>Date:<br>Last Map Published Not Applicable<br>Date:      | A6NE (SW)                              | 11                           | -       | 389053<br>410025 |
| 9      | <b>Extractive Industries or Potential Excavations from 1855-1909</b><br>Use: Old Gravel Pit<br>First Map Published 1893<br>Date:<br>Last Map Published Not Applicable<br>Date: | A10SE (NW)                             | 51                           | -       | 388934<br>410484 |
| 10     | <b>Extractive Industries or Potential Excavations from 1893-1915</b><br>Use: Mill Pond<br>First Map Published 1910<br>Date:<br>Last Map Published Not Applicable<br>Date:      | A7NW (S)                               | 0                            | -       | 389212<br>410062 |
| 11     | <b>Extractive Industries or Potential Excavations from 1893-1915</b><br>Use: Reservoir<br>First Map Published 1910<br>Date:<br>Last Map Published Not Applicable<br>Date:      | A7NW (S)                               | 0                            | -       | 389230<br>410126 |
| 12     | <b>Extractive Industries or Potential Excavations from 1893-1915</b><br>Use: Reservoir<br>First Map Published 1910<br>Date:<br>Last Map Published Not Applicable<br>Date:      | A7NW (SE)                              | 1                            | -       | 389407<br>410096 |
| 13     | <b>Extractive Industries or Potential Excavations from 1893-1915</b><br>Use: Reservoir<br>First Map Published 1910<br>Date:<br>Last Map Published Not Applicable<br>Date:      | A6NE (SW)                              | 12                           | -       | 389053<br>410026 |
| 14     | <b>Extractive Industries or Potential Excavations from 1893-1915</b><br>Use: Reservoir<br>First Map Published 1910<br>Date:<br>Last Map Published Not Applicable<br>Date:      | A6NE (S)                               | 14                           | -       | 389195<br>410010 |
| 15     | <b>Extractive Industries or Potential Excavations from 1893-1915</b><br>Use: Old Sand Pit<br>First Map Published 1910<br>Date:<br>Last Map Published Not Applicable<br>Date:   | A10SE (NW)                             | 50                           | -       | 388937<br>410486 |



| Map ID | Details                                                                                                                                                                                        | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR              |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|------------------|
| 16     | <b>Extractive Industries or Potential Excavations from 1893-1915</b><br>Use: Unspecified Pit<br>First Map Published 1910<br>Date:<br>Last Map Published Not Applicable<br>Date:                | A6NW (W)                               | 60                           | -       | 388799<br>410233 |
| 17     | <b>Extractive Industries or Potential Excavations from 1893-1915</b><br>Use: Old Sand Pits<br>First Map Published 1910<br>Date:<br>Last Map Published Not Applicable<br>Date:                  | A10SW (W)                              | 80                           | -       | 388834<br>410373 |
| 18     | <b>Extractive Industries or Potential Excavations from 1906-1937</b><br>Use: Reservoir<br>First Map Published 1929<br>Date:<br>Last Map Published Not Applicable<br>Date:                      | A7NW (S)                               | 0                            | -       | 389230<br>410127 |
| 19     | <b>Extractive Industries or Potential Excavations from 1906-1937</b><br>Use: Reservoir<br>First Map Published 1930<br>Date:<br>Last Map Published Not Applicable<br>Date:                      | A7NW (SE)                              | 1                            | -       | 389404<br>410096 |
| 20     | <b>Extractive Industries or Potential Excavations from 1906-1937</b><br>Use: Mill Pond<br>First Map Published 1929<br>Date:<br>Last Map Published Not Applicable<br>Date:                      | A6NE (S)                               | 3                            | -       | 389191<br>410046 |
| 21     | <b>Extractive Industries or Potential Excavations from 1906-1937</b><br>Use: Reservoir<br>First Map Published 1929<br>Date:<br>Last Map Published Not Applicable<br>Date:                      | A6NE (SW)                              | 11                           | -       | 389018<br>410050 |
| 22     | <b>Extractive Industries or Potential Excavations from 1906-1937</b><br>Use: Reservoir<br>First Map Published 1929<br>Date:<br>Last Map Published Not Applicable<br>Date:                      | A6NE (S)                               | 12                           | -       | 389195<br>410011 |
| 23     | <b>Extractive Industries or Potential Excavations from 1906-1937</b><br>Use: Unspecified Deposited Material<br>First Map Published 1929<br>Date:<br>Last Map Published Not Applicable<br>Date: | A10SE (NW)                             | 51                           | -       | 388934<br>410484 |
| 24     | <b>Extractive Industries or Potential Excavations from 1906-1937</b><br>Use: Unspecified Pit<br>First Map Published 1929<br>Date:<br>Last Map Published Not Applicable<br>Date:                | A10SW (W)                              | 80                           | -       | 388833<br>410371 |
| 25     | <b>Extractive Industries or Potential Excavations from 1906-1937</b><br>Use: Unspecified Pit<br>First Map Published 1929<br>Date:<br>Last Map Published Not Applicable<br>Date:                | A6NE (SW)                              | 87                           | -       | 389053<br>410020 |
| 26     | <b>Extractive Industries or Potential Excavations from 1924-1949</b><br>Use: Reservoir<br>First Map Published 1937<br>Date:<br>Last Map Published Not Applicable<br>Date:                      | A7NW (S)                               | 0                            | -       | 389227<br>410127 |

| Map ID | Details                                                                                                                                                                         | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR              |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|------------------|
| 27     | <b>Extractive Industries or Potential Excavations from 1924-1949</b><br>Use: Reservoir<br>First Map Published 1937<br>Date:<br>Last Map Published Not Applicable<br>Date:       | A7NW (SE)                              | 2                            | -       | 389407<br>410096 |
| 28     | <b>Extractive Industries or Potential Excavations from 1924-1949</b><br>Use: Mill Pond<br>First Map Published 1937<br>Date:<br>Last Map Published Not Applicable<br>Date:       | A6NE (S)                               | 4                            | -       | 389188<br>410047 |
| 29     | <b>Extractive Industries or Potential Excavations from 1924-1949</b><br>Use: Reservoir<br>First Map Published 1937<br>Date:<br>Last Map Published Not Applicable<br>Date:       | A6NE (S)                               | 11                           | -       | 389197<br>410012 |
| 30     | <b>Extractive Industries or Potential Excavations from 1924-1949</b><br>Use: Reservoir<br>First Map Published 1937<br>Date:<br>Last Map Published Not Applicable<br>Date:       | A6NE (SW)                              | 11                           | -       | 389043<br>410032 |
| 31     | <b>Extractive Industries or Potential Excavations from 1924-1949</b><br>Use: Unspecified Pit<br>First Map Published 1937<br>Date:<br>Last Map Published Not Applicable<br>Date: | A6NW (SW)                              | 79                           | -       | 388821<br>410052 |
| 32     | <b>Extractive Industries or Potential Excavations from 1924-1949</b><br>Use: Unspecified Pit<br>First Map Published 1937<br>Date:<br>Last Map Published Not Applicable<br>Date: | A10SW (W)                              | 82                           | -       | 388832<br>410375 |
| 33     | <b>Extractive Industries or Potential Excavations from 1950-1980</b><br>Use: Reservoir<br>First Map Published 1956<br>Date:<br>Last Map Published 1956<br>Date:                 | A7NW (S)                               | 1                            | -       | 389228<br>410127 |
| 34     | <b>Extractive Industries or Potential Excavations from 1950-1980</b><br>Use: Reservoir<br>First Map Published 1956<br>Date:<br>Last Map Published 1956<br>Date:                 | A7NW (SE)                              | 3                            | -       | 389404<br>410093 |
| 35     | <b>Extractive Industries or Potential Excavations from 1950-1980</b><br>Use: Mill Pond<br>First Map Published 1956<br>Date:<br>Last Map Published 1956<br>Date:                 | A6NE (S)                               | 5                            | -       | 389189<br>410045 |
| 36     | <b>Extractive Industries or Potential Excavations from 1950-1980</b><br>Use: Reservoir<br>First Map Published 1956<br>Date:<br>Last Map Published 1956<br>Date:                 | A7NW (S)                               | 12                           | -       | 389206<br>410014 |
| 37     | <b>Extractive Industries or Potential Excavations from 1950-1980</b><br>Use: Reservoir<br>First Map Published 1956<br>Date:<br>Last Map Published 1956<br>Date:                 | A6NE (SW)                              | 14                           | -       | 389013<br>410044 |

| Map ID | Details                                                                                                                                                               | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR              |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|------------------|
| 38     | <b>Extractive Industries or Potential Excavations from 1950-1980</b><br>Use: Pond<br>First Map Published 1956<br>Date:<br>Last Map Published 1956<br>Date:            | A7NW (SE)                              | 67                           | -       | 389441<br>410040 |
| 39     | <b>Extractive Industries or Potential Excavations from 1950-1980</b><br>Use: Unspecified Pit<br>First Map Published 1956<br>Date:<br>Last Map Published 1956<br>Date: | A10SW (W)                              | 84                           | -       | 388831<br>410374 |

| Map ID | Details                                                                                                                                | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
| 40     | <b>Quarrying of sand &amp; clay, operation of sand &amp; gravel pits</b><br>Use: Not Supplied<br>Date of Mapping: 1910                 | A10SE (NW)                             | 44                           | -       | 388942 410481 |
| 41     | <b>Quarrying of sand &amp; clay, operation of sand &amp; gravel pits</b><br>Use: Not Supplied<br>Date of Mapping: 1910                 | A10SW (W)                              | 95                           | -       | 388822 410383 |
| 41     | <b>Quarrying of sand &amp; clay, operation of sand &amp; gravel pits</b><br>Use: Not Supplied<br>Date of Mapping: 1910                 | A10SW (W)                              | 136                          | -       | 388776 410367 |
| 42     | <b>Quarrying of sand &amp; clay, operation of sand &amp; gravel pits</b><br>Use: Not Supplied<br>Date of Mapping: 1956                 | A6NW (SW)                              | 182                          | -       | 388722 410004 |
| 43     | <b>Quarrying of sand &amp; clay, operation of sand &amp; gravel pits</b><br>Use: Not Supplied<br>Date of Mapping: 1932 - 1956          | A7SW (S)                               | 191                          | -       | 389284 409830 |
| 44     | <b>Quarrying of sand &amp; clay, operation of sand &amp; gravel pits</b><br>Use: Not Supplied<br>Date of Mapping: 1894 - 1910          | A6SW (SW)                              | 474                          | -       | 388725 409663 |
| 45     | <b>Former Marshes</b><br>Use: Former Marsh<br>Date of Mapping: 1851                                                                    | A10NE (NW)                             | 175                          | -       | 388945 410643 |
| 46     | <b>Potentially Infilled Land (Non-Water)</b><br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993                  | A10SE (NW)                             | 44                           | -       | 388942 410481 |
| 47     | <b>Potentially Infilled Land (Non-Water)</b><br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993                  | A10SW (W)                              | 95                           | -       | 388822 410383 |
| 48     | <b>Potentially Infilled Land (Non-Water)</b><br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993                  | A10SW (W)                              | 136                          | -       | 388776 410367 |
| 49     | <b>Potentially Infilled Land (Non-Water)</b><br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1984                  | A6NW (SW)                              | 182                          | -       | 388722 410004 |
| 50     | <b>Potentially Infilled Land (Non-Water)</b><br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1984                  | A7SW (S)                               | 191                          | -       | 389284 409830 |
| 51     | <b>Potentially Infilled Land (Non-Water)</b><br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993                  | A10NW (NW)                             | 449                          | -       | 388743 410850 |
| 52     | <b>Potentially Infilled Land (Non-Water)</b><br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1984                  | A6SW (SW)                              | 474                          | -       | 388725 409663 |
| 53     | <b>Potentially Infilled Land (Water)</b><br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1956 | A7NW (SE)                              | 85                           | -       | 389459 410027 |
| 54     | <b>Potentially Infilled Land (Water)</b><br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1956 | A7NE (E)                               | 181                          | -       | 389688 410278 |
| 55     | <b>Potentially Infilled Land (Water)</b><br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1956 | A7SW (SE)                              | 274                          | -       | 389518 409825 |
| 56     | <b>Potentially Infilled Land (Water)</b><br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1931 | A11SE (E)                              | 409                          | -       | 389830 410499 |
| 57     | <b>Potentially Infilled Land (Water)</b><br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1910 | A10NW (NW)                             | 422                          | -       | 388758 410828 |
| 58     | <b>Potentially Infilled Land (Water)</b><br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1851 | A10NW (NW)                             | 500                          | -       | 388759 410918 |



| Map ID | Details                                                                                                                                                                               | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
|        | <b>Brine Compensation Area</b><br>The site does not fall within the brine compensation area.                                                                                          |                                        |                              |         |               |
|        | <b>Brine Subsidence Solution Area</b><br>The site does not fall within the brine subsidence solution area.                                                                            |                                        |                              |         |               |
| 59     | <b>Potential for Collapsible Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service                 | A6NE (N)                               | 0                            | 1       | 389200 410258 |
| 60     | <b>Potential for Collapsible Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service                 | A6NE (S)                               | 19                           | 1       | 389200 410000 |
| 61     | <b>Potential for Compressible Ground Stability Hazards</b><br>Hazard Potential: Moderate<br>Source: British Geological Survey, National Geoscience Information Service                | A6SE (S)                               | 192                          | 1       | 389200 409830 |
|        | <b>Potential for Compressible Ground Stability Hazards</b><br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service               | A6NE (N)                               | 0                            | 1       | 389200 410258 |
|        | <b>Potential for Compressible Ground Stability Hazards</b><br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service               | A6NE (S)                               | 19                           | 1       | 389200 410000 |
|        | <b>Potential for Ground Dissolution Stability Hazards</b><br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service                | A6NE (N)                               | 0                            | 1       | 389200 410258 |
|        | <b>Potential for Ground Dissolution Stability Hazards</b><br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service                | A6NE (S)                               | 19                           | 1       | 389200 410000 |
| 62     | <b>Potential for Landslide Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service                   | A6NE (N)                               | 0                            | 1       | 389200 410258 |
| 63     | <b>Potential for Landslide Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service                   | A6NE (S)                               | 19                           | 1       | 389200 410000 |
| 64     | <b>Potential for Running Sand Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service                | A6NE (N)                               | 0                            | 1       | 389200 410258 |
| 65     | <b>Potential for Running Sand Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service                | A6NE (S)                               | 19                           | 1       | 389200 410000 |
| 66     | <b>Potential for Shrinking or Swelling Clay Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service  | A6NE (SW)                              | 0                            | 1       | 389101 410041 |
| 67     | <b>Potential for Shrinking or Swelling Clay Ground Stability Hazards</b><br>Hazard Potential: Low<br>Source: British Geological Survey, National Geoscience Information Service       | A6NE (N)                               | 0                            | 1       | 389200 410258 |
| 68     | <b>Potential for Shrinking or Swelling Clay Ground Stability Hazards</b><br>Hazard Potential: Low<br>Source: British Geological Survey, National Geoscience Information Service       | A6NE (S)                               | 19                           | 1       | 389200 410000 |
| 69     | <b>Potential for Shrinking or Swelling Clay Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service  | A6NE (S)                               | 50                           | 1       | 389172 410000 |
| 70     | <b>Potential for Shrinking or Swelling Clay Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service  | A7NE (SE)                              | 62                           | 1       | 389578 410036 |
| 71     | <b>Potential for Shrinking or Swelling Clay Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service  | A7NE (SE)                              | 108                          | 1       | 389575 410000 |
| 72     | <b>Potential for Shrinking or Swelling Clay Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service  | A10SW (NW)                             | 187                          | 1       | 388809 410537 |
|        | <b>Potential for Shrinking or Swelling Clay Ground Stability Hazards</b><br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A6NE (W)                               | 0                            | 1       | 388874 410127 |

| Map ID | Details                                                                                                                                                                                                          | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
|        | <b>Potential for Shrinking or Swelling Clay Ground Stability Hazards</b><br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service                            | A6NE (S)                               | 48                           | 1       | 389172 410000 |
|        | <b>Subsidence Investigations</b><br>Site Investigation Date: 5th November 2010<br>Root Survey: No<br>CCTV Drain Survey: No<br>Depth of Foundation: Not Supplied<br>Footing:<br>Soil Classification: Not Supplied |                                        |                              | -       |               |

| Map ID | Details                                                          | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR              |
|--------|------------------------------------------------------------------|----------------------------------------|------------------------------|---------|------------------|
| 73     | <b>Motion Map</b><br>Average Velocity -0.1<br>Gradient (mmyear): | A11SW (N)                              | 2                            | -       | 389287<br>410525 |
| 73     | <b>Motion Map</b><br>Average Velocity 0.2<br>Gradient (mmyear):  | A11SW (N)                              | 3                            | -       | 389291<br>410528 |
| 73     | <b>Motion Map</b><br>Average Velocity -0.1<br>Gradient (mmyear): | A11SW (N)                              | 4                            | -       | 389290<br>410529 |
| 73     | <b>Motion Map</b><br>Average Velocity 0.2<br>Gradient (mmyear):  | A11SW (N)                              | 5                            | -       | 389293<br>410532 |
| 74     | <b>Motion Map</b><br>Average Velocity -0.4<br>Gradient (mmyear): | A11SW (NE)                             | 21                           | -       | 389340<br>410554 |
| 74     | <b>Motion Map</b><br>Average Velocity -0.4<br>Gradient (mmyear): | A11SW (NE)                             | 25                           | -       | 389343<br>410557 |
| 75     | <b>Motion Map</b><br>Average Velocity 0.1<br>Gradient (mmyear):  | A11SW (NE)                             | 47                           | -       | 389361<br>410570 |
| 75     | <b>Motion Map</b><br>Average Velocity -0.1<br>Gradient (mmyear): | A11SW (NE)                             | 48                           | -       | 389363<br>410569 |
| 75     | <b>Motion Map</b><br>Average Velocity 0.1<br>Gradient (mmyear):  | A11SW (NE)                             | 53                           | -       | 389366<br>410572 |
| 76     | <b>Motion Map</b><br>Average Velocity 0.2<br>Gradient (mmyear):  | A6NW (W)                               | 50                           | -       | 388813<br>410110 |
| 76     | <b>Motion Map</b><br>Average Velocity 0.0<br>Gradient (mmyear):  | A6NW (W)                               | 50                           | -       | 388815<br>410105 |
| 77     | <b>Motion Map</b><br>Average Velocity -2.0<br>Gradient (mmyear): | A10SW (W)                              | 59                           | -       | 388819<br>410296 |
| 78     | <b>Motion Map</b><br>Average Velocity -0.7<br>Gradient (mmyear): | A11SW (N)                              | 67                           | -       | 389328<br>410609 |
| 78     | <b>Motion Map</b><br>Average Velocity -0.6<br>Gradient (mmyear): | A11SW (N)                              | 67                           | -       | 389326<br>410610 |
| 79     | <b>Motion Map</b><br>Average Velocity -0.1<br>Gradient (mmyear): | A11SW (NE)                             | 68                           | -       | 389379<br>410581 |
| 79     | <b>Motion Map</b><br>Average Velocity 0.7<br>Gradient (mmyear):  | A11SW (NE)                             | 69                           | -       | 389383<br>410576 |
| 79     | <b>Motion Map</b><br>Average Velocity -0.3<br>Gradient (mmyear): | A11SW (NE)                             | 73                           | -       | 389384<br>410580 |
| 79     | <b>Motion Map</b><br>Average Velocity -0.1<br>Gradient (mmyear): | A11SW (NE)                             | 76                           | -       | 389386<br>410584 |
| 80     | <b>Motion Map</b><br>Average Velocity 0.1<br>Gradient (mmyear):  | A7SW (S)                               | 86                           | -       | 389255<br>409934 |

The following mapping has been analysed for Historical Land Use Information (1:2,500):

| 1:2,500                | Mapsheet | Published Date |
|------------------------|----------|----------------|
| Lancashire And Furness | 089_09   | 1890           |
| Lancashire And Furness | 089_09   | 1890           |
| Lancashire And Furness | 088_12   | 1893           |
| Lancashire And Furness | 088_12   | 1893           |
| Lancashire And Furness | 088_12   | 1893           |
| Lancashire And Furness | 088_12   | 1893           |
| Lancashire And Furness | 088_12   | 1910           |
| Lancashire And Furness | 088_12   | 1910           |
| Lancashire And Furness | 088_12   | 1910           |
| Lancashire And Furness | 088_12   | 1910           |
| Lancashire And Furness | 089_09   | 1910           |
| Lancashire And Furness | 089_09   | 1910           |
| Lancashire And Furness | 088_12   | 1929           |
| Lancashire And Furness | 088_12   | 1929           |
| Lancashire And Furness | 088_12   | 1929           |
| Lancashire And Furness | 088_12   | 1929           |
| Lancashire And Furness | 089_09   | 1930           |
| Lancashire And Furness | 089_09   | 1930           |
| Lancashire And Furness | 088_12   | 1937           |
| Lancashire And Furness | 088_12   | 1937           |
| Lancashire And Furness | 088_12   | 1937           |
| Lancashire And Furness | 088_12   | 1937           |
| Lancashire And Furness | 089_09   | 1937           |
| Lancashire And Furness | 089_09   | 1937           |
| Ordnance Survey Plan   | SD8809   | 1956           |
| Ordnance Survey Plan   | SD8810   | 1956           |
| Ordnance Survey Plan   | SD8810   | 1956           |
| Ordnance Survey Plan   | SD8909   | 1956           |
| Ordnance Survey Plan   | SD8909   | 1956           |
| Ordnance Survey Plan   | SD8910   | 1956           |
| Ordnance Survey Plan   | SD8910   | 1956           |
| Ordnance Survey Plan   | SD8910   | 1956           |
| Ordnance Survey Plan   | SD8910   | 1956           |



The following mapping has been analysed for Historical Land Use Information (1:10,000):

| 1:10,560               | Mapsheet | Published Date |
|------------------------|----------|----------------|
| Lancashire And Furness | 088_00   | 1851           |
| Lancashire And Furness | 089_00   | 1851           |
| Yorkshire              | 258_00   | 1854           |
| Lancashire And Furness | 088_NE   | 1894           |
| Lancashire And Furness | 088_SE   | 1894           |
| Lancashire And Furness | 089_NW   | 1894           |
| Lancashire And Furness | 089_SW   | 1894           |
| Lancashire And Furness | 088_SE   | 1910           |
| Lancashire And Furness | 089_NW   | 1910           |
| Lancashire And Furness | 089_SW   | 1910           |
| Lancashire And Furness | 088_NE   | 1911           |
| Lancashire And Furness | 089_NW   | 1931           |
| Lancashire And Furness | 089_SW   | 1931           |
| Lancashire And Furness | 088_NE   | 1932           |
| Lancashire And Furness | 088_SE   | 1932           |
| Ordnance Survey Plan   | SD80NE   | 1956           |
| Ordnance Survey Plan   | SD81SE   | 1956           |
| Ordnance Survey Plan   | SD90NW   | 1956           |
| Ordnance Survey Plan   | SD91SW   | 1956           |
| 1:10,000               | Mapsheet | Published Date |
| Ordnance Survey Plan   | SD80NE   | 1984           |
| Ordnance Survey Plan   | SD91SW   | 1989           |
| Ordnance Survey Plan   | SD90NW   | 1990           |
| Ordnance Survey Plan   | SD81SE   | 1993           |

| Mining and Cavities Data                                                                                                                        | Version       | Update Cycle   |
|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------|
| <b>BGS Recorded Mineral Sites</b><br>British Geological Survey - National Geoscience Information Service                                        | November 2015 | Bi-Annually    |
| <b>Coal Mining Affected Areas</b><br>The Coal Authority - Mining Report Service                                                                 | March 2014    | As notified    |
| <b>Man Made Mining Cavities</b><br>Peter Brett Associates                                                                                       | October 2015  | Bi-Annually    |
| <b>Mining Instability</b><br>Ove Arup & Partners                                                                                                | October 2000  | Not Applicable |
| <b>Natural Cavities</b><br>Peter Brett Associates                                                                                               | October 2015  | Bi-Annually    |
| <b>Non Coal Mining Areas of Great Britain</b><br>British Geological Survey - National Geoscience Information Service                            | July 2014     | Not Applicable |
| Historical Land Use Information (1:2,500)                                                                                                       | Version       | Update Cycle   |
| <b>Subterranean Features</b><br>Landmark Information Group Limited                                                                              | August 2015   | Bi-Annually    |
| Ground Stability Data (1:50,000)                                                                                                                | Version       | Update Cycle   |
| <b>Brine Compensation Area</b><br>Cheshire Brine Subsidence Compensation Board                                                                  | August 2011   | Not Applicable |
| <b>Potential for Collapsible Ground Stability Hazards</b><br>British Geological Survey - National Geoscience Information Service                | June 2015     | Annually       |
| <b>Potential for Compressible Ground Stability Hazards</b><br>British Geological Survey - National Geoscience Information Service               | June 2015     | Annually       |
| <b>Potential for Ground Dissolution Stability Hazards</b><br>British Geological Survey - National Geoscience Information Service                | June 2015     | Annually       |
| <b>Potential for Landslide Ground Stability Hazards</b><br>British Geological Survey - National Geoscience Information Service                  | June 2015     | Annually       |
| <b>Potential for Running Sand Ground Stability Hazards</b><br>British Geological Survey - National Geoscience Information Service               | June 2015     | Annually       |
| <b>Potential for Shrinking or Swelling Clay Ground Stability Hazards</b><br>British Geological Survey - National Geoscience Information Service | June 2015     | Annually       |
| <b>Subsidence Insurance Claims</b><br>SP Property Services                                                                                      | November 2015 | Quarterly      |
| <b>Subsidence Investigations</b><br>CET Structures Ltd                                                                                          | November 2015 | Quarterly      |

| Motion Map Data (1:2,500)                | Version        | Update Cycle |
|------------------------------------------|----------------|--------------|
| <b>Motion Map</b>                        |                |              |
| Nigel Press Associates - Hampshire       | February 2011  | As notified  |
| Nigel Press Associates - Cambridge       | January 2011   | As notified  |
| Nigel Press Associates - Ipswich         | January 2011   | As notified  |
| Nigel Press Associates - Norwich         | January 2011   | As notified  |
| Nigel Press Associates - Peterborough    | January 2011   | As notified  |
| Nigel Press Associates - Barnstaple      | July 2010      | As notified  |
| Nigel Press Associates - Derbyshire      | July 2010      | As notified  |
| Nigel Press Associates - Humberside      | July 2010      | As notified  |
| Nigel Press Associates - Kent            | July 2010      | As notified  |
| Nigel Press Associates - Lincolnshire    | July 2010      | As notified  |
| Nigel Press Associates - Nottinghamshire | July 2010      | As notified  |
| Nigel Press Associates - Birmingham      | May 2009       | As notified  |
| Nigel Press Associates - Bournemouth     | May 2009       | As notified  |
| Nigel Press Associates - Brighton        | May 2009       | As notified  |
| Nigel Press Associates - Bristol         | May 2009       | As notified  |
| Nigel Press Associates - Cardiff         | May 2009       | As notified  |
| Nigel Press Associates - Central London  | May 2009       | As notified  |
| Nigel Press Associates - Cheltenham      | May 2009       | As notified  |
| Nigel Press Associates - Coventry        | May 2009       | As notified  |
| Nigel Press Associates - Crawley         | May 2009       | As notified  |
| Nigel Press Associates - Edinburgh       | May 2009       | As notified  |
| Nigel Press Associates - Exeter          | May 2009       | As notified  |
| Nigel Press Associates - Glasgow         | May 2009       | As notified  |
| Nigel Press Associates - Isle of Wight   | May 2009       | As notified  |
| Nigel Press Associates - Leeds           | May 2009       | As notified  |
| Nigel Press Associates - Leicester       | May 2009       | As notified  |
| Nigel Press Associates - Liverpool       | May 2009       | As notified  |
| Nigel Press Associates - Manchester      | May 2009       | As notified  |
| Nigel Press Associates - Milton Keynes   | May 2009       | As notified  |
| Nigel Press Associates - Newcastle       | May 2009       | As notified  |
| Nigel Press Associates - Northwich       | May 2009       | As notified  |
| Nigel Press Associates - Nottingham      | May 2009       | As notified  |
| Nigel Press Associates - Oxford          | May 2009       | As notified  |
| Nigel Press Associates - Plymouth        | May 2009       | As notified  |
| Nigel Press Associates - Portsmouth      | May 2009       | As notified  |
| Nigel Press Associates - Preston         | May 2009       | As notified  |
| Nigel Press Associates - Reading         | May 2009       | As notified  |
| Nigel Press Associates - Sheffield       | May 2009       | As notified  |
| Nigel Press Associates - Stoke           | May 2009       | As notified  |
| Nigel Press Associates - Swindon         | May 2009       | As notified  |
| Nigel Press Associates - Tonbridge       | May 2009       | As notified  |
| Nigel Press Associates - North London    | November 2008  | As notified  |
| Nigel Press Associates - Head Office     | September 2008 | As notified  |

A selection of organisations who provide data within this report

| Data Supplier             | Data Supplier Logo                                                                   |
|---------------------------|--------------------------------------------------------------------------------------|
| Ordnance Survey           |   |
| British Geological Survey |   |
| The Coal Authority        |   |
| Ove Arup                  |   |
| Peter Brett Associates    |   |
| Wardell Armstrong         |   |
| Johnson Poole & Bloomer   |  |



| Contact | Name and Address                                                                                                                                            | Contact Details                                                                                                                                                                                                                      |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | <b>British Geological Survey - Enquiry Service</b><br>British Geological Survey, Kingsley Dunham Centre, Keyworth,<br>Nottingham, Nottinghamshire, NG12 5GG | Telephone: 0115 936 3143<br>Fax: 0115 936 3276<br>Email: <a href="mailto:enquiries@bgs.ac.uk">enquiries@bgs.ac.uk</a><br>Website: <a href="http://www.bgs.ac.uk">www.bgs.ac.uk</a>                                                   |
| 2       | <b>The Coal Authority - Mining Report Service</b><br>200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG                                               | Telephone: 0845 7626848<br>Email: <a href="mailto:thecoalauthority@coal.gov.uk">thecoalauthority@coal.gov.uk</a>                                                                                                                     |
| 3       | <b>Ove Arup &amp; Partners</b><br>Central Square, Forth Street, Newcastle upon Tyne, Tyne and Wear, NE1<br>3PL                                              | Telephone: 0191 261 6080<br>Fax: 0191 261 7879                                                                                                                                                                                       |
| -       | <b>Landmark Information Group Limited</b><br>Imperium, Imperial Way, Reading, Berkshire, RG2 0TD                                                            | Telephone: 0844 844 9952<br>Fax: 0844 844 9951<br>Email: <a href="mailto:customerservices@landmarkinfo.co.uk">customerservices@landmarkinfo.co.uk</a><br>Website: <a href="http://www.landmarkinfo.co.uk">www.landmarkinfo.co.uk</a> |

## Historical Land Use Information (1:2,500)

### General

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

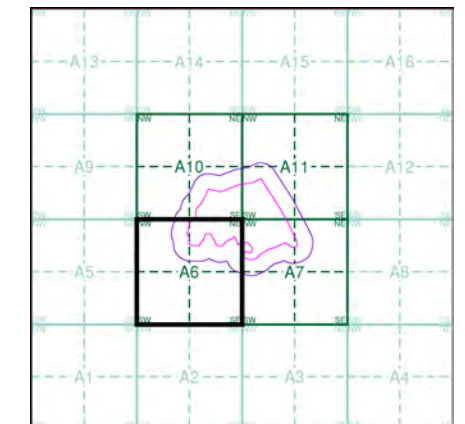
### Potentially Contaminative Industrial Uses (Extractive Industries Activity)

|                                                 | Point | Line | Polygon |
|-------------------------------------------------|-------|------|---------|
| Extractive Industries Activity from 1855 - 1909 | ▲     | —    | ■       |
| Extractive Industries Activity from 1893 - 1915 | ▲     | —    | ■       |
| Extractive Industries Activity from 1906 - 1937 | ▲     | —    | ■       |
| Extractive Industries Activity from 1924 - 1949 | ▲     | —    | ■       |
| Extractive Industries Activity from 1950 - 1980 | ▲     | —    | ■       |

### Subterranean Features

|                       | Point | Line | Polygon |
|-----------------------|-------|------|---------|
| Subterranean Features | ▼     | ---  | ■       |

## Mining and Ground Stability - Segment A6

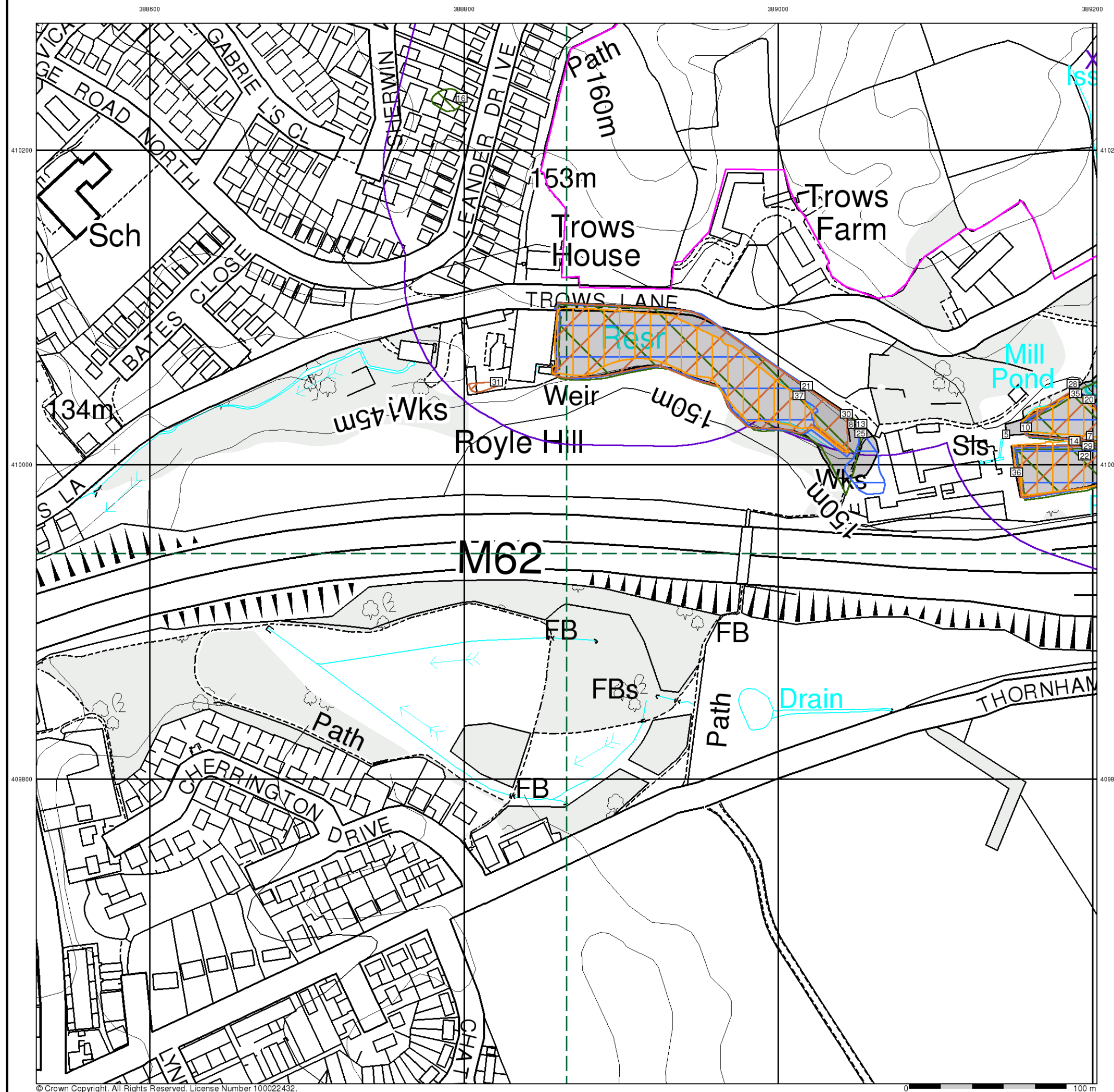


### Order Details

Order Number: 77317590\_1\_1  
Customer Ref: R2228  
National Grid Reference: 389200, 410260  
Slice: A  
Site Area (Ha): 21.43  
Plot Buffer (m): 100

### Site Details

Site at 389190, 410260



## Historical Land Use Information (1:2,500)

### General

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

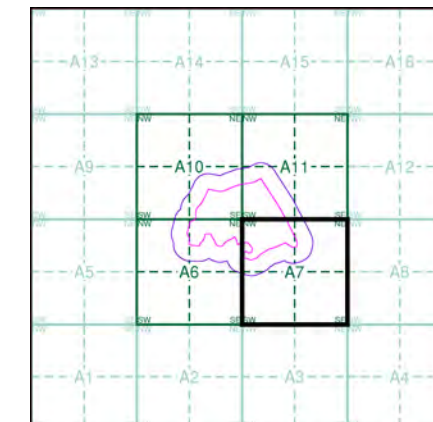
### Potentially Contaminative Industrial Uses (Extractive Industries Activity)

|                                                 | Point | Line | Polygon |
|-------------------------------------------------|-------|------|---------|
| Extractive Industries Activity from 1855 - 1909 | ▲     | —    | ■       |
| Extractive Industries Activity from 1893 - 1915 | ▲     | —    | ■       |
| Extractive Industries Activity from 1906 - 1937 | ▲     | —    | ■       |
| Extractive Industries Activity from 1924 - 1949 | ▲     | —    | ■       |
| Extractive Industries Activity from 1950 - 1980 | ▲     | —    | ■       |

### Subterranean Features

|                       | Point | Line  | Polygon |
|-----------------------|-------|-------|---------|
| Subterranean Features | ▼     | - - - | ■       |

## Mining and Ground Stability - Segment A7

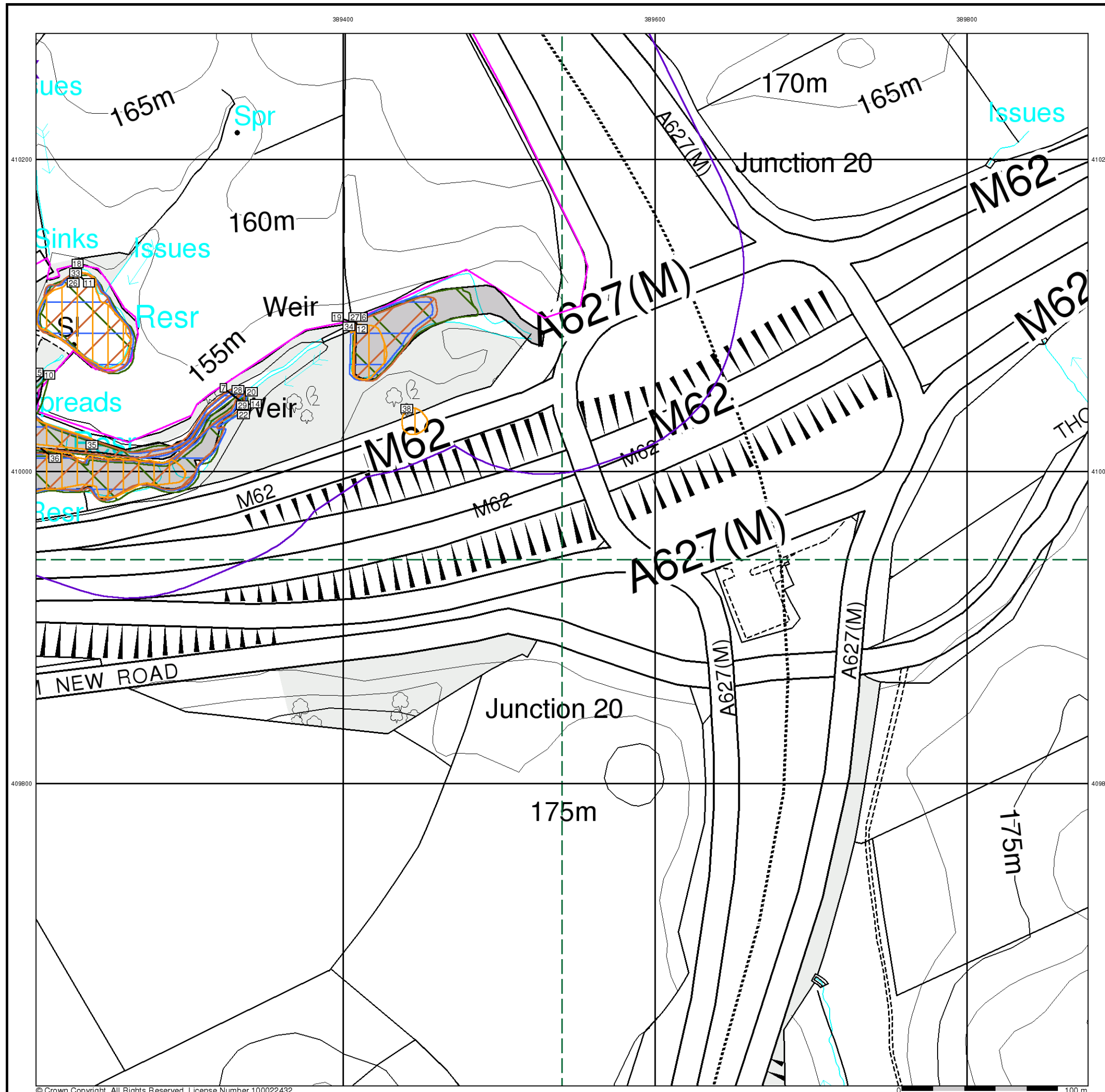


### Order Details

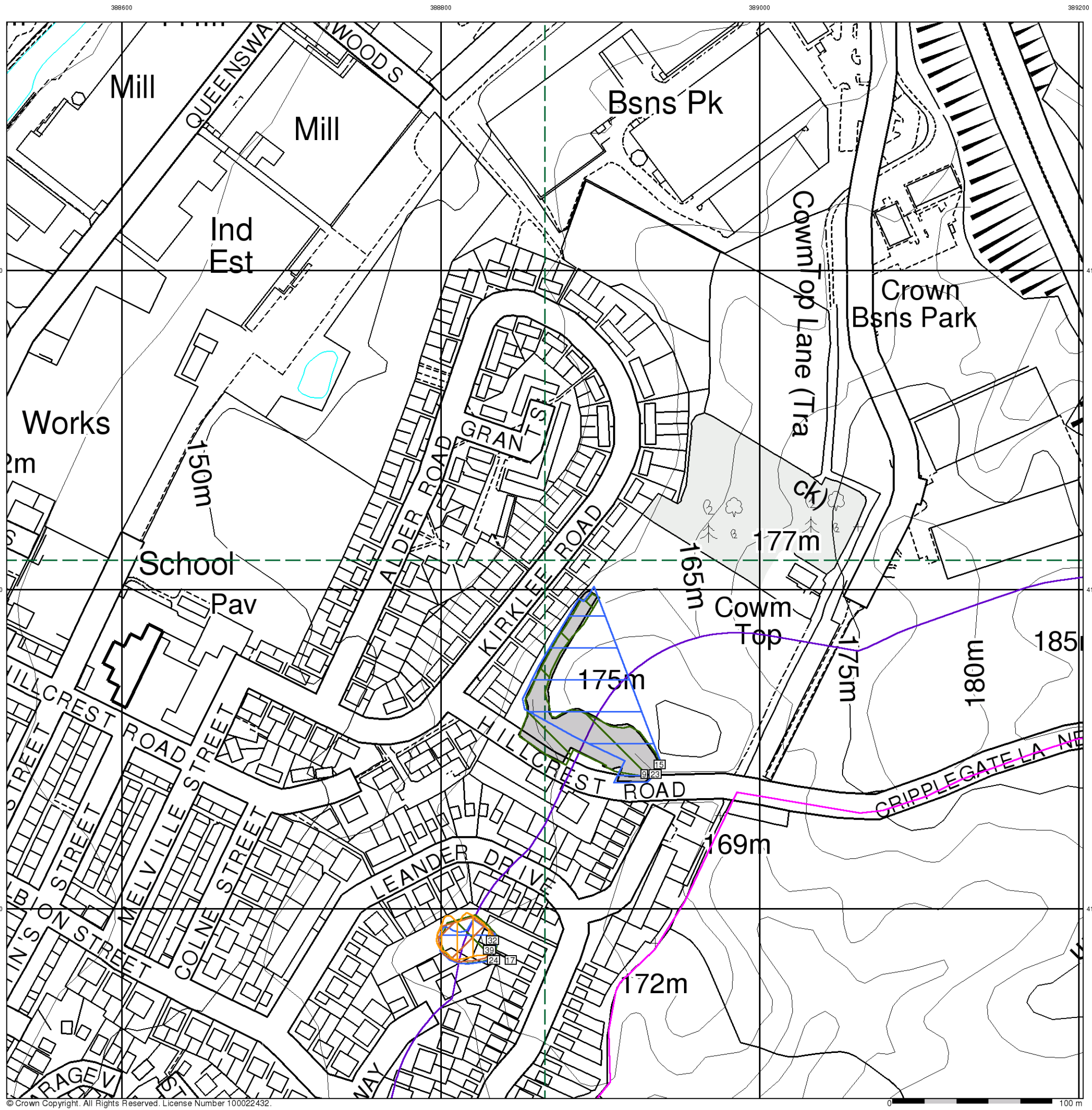
Order Number: 77317590\_1\_1  
 Customer Ref: R2228  
 National Grid Reference: 389200, 410260  
 Slice: A  
 Site Area (Ha): 21.43  
 Plot Buffer (m): 100

### Site Details

Site at 389190, 410260



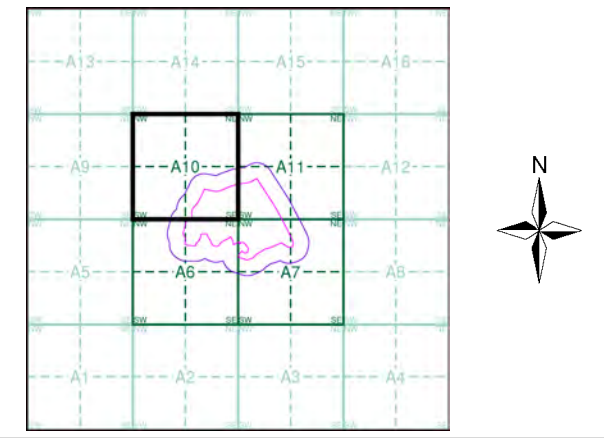




## Historical Land Use Information (1:2,500)

| General                                                                    |                     |                         |         |
|----------------------------------------------------------------------------|---------------------|-------------------------|---------|
| Specified Site                                                             | Specified Buffer(s) | Bearing Reference Point | Map ID  |
| Several of Type at Location                                                |                     |                         |         |
| Potentially Contaminative Industrial Uses (Extractive Industries Activity) |                     |                         |         |
|                                                                            | Point               | Line                    | Polygon |
| Extractive Industries Activity from 1855 - 1909                            |                     |                         |         |
| Extractive Industries Activity from 1893 - 1915                            |                     |                         |         |
| Extractive Industries Activity from 1906 - 1937                            |                     |                         |         |
| Extractive Industries Activity from 1924 - 1949                            |                     |                         |         |
| Extractive Industries Activity from 1950 - 1980                            |                     |                         |         |
| Subterranean Features                                                      |                     |                         |         |
|                                                                            | Point               | Line                    | Polygon |
| Subterranean Features                                                      |                     |                         |         |

## Mining and Ground Stability - Segment A10



| Order Details            |                |
|--------------------------|----------------|
| Order Number:            | 77317590_1_1   |
| Customer Ref:            | R2228          |
| National Grid Reference: | 389200, 410260 |
| Slice:                   | A              |
| Site Area (Ha):          | 21.43          |
| Plot Buffer (m):         | 100            |

**Site Details**  
Site at 389190, 410260



## Historical Land Use Information (1:2,500)

### General

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

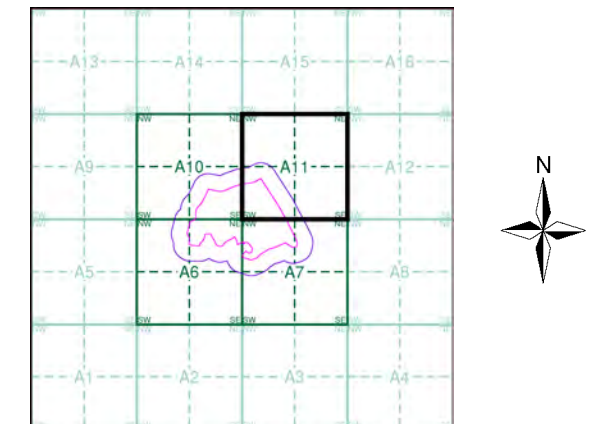
### Potentially Contaminative Industrial Uses (Extractive Industries Activity)

|                                                 | Point | Line | Polygon |
|-------------------------------------------------|-------|------|---------|
| Extractive Industries Activity from 1855 - 1909 | ▲     | —    | ■       |
| Extractive Industries Activity from 1893 - 1915 | ▲     | —    | ■       |
| Extractive Industries Activity from 1906 - 1937 | ▲     | —    | ■       |
| Extractive Industries Activity from 1924 - 1949 | ▲     | —    | ■       |
| Extractive Industries Activity from 1950 - 1980 | ▲     | —    | ■       |

### Subterranean Features

|                       | Point | Line | Polygon |
|-----------------------|-------|------|---------|
| Subterranean Features | ▼     | ---  | ■       |

## Mining and Ground Stability - Segment A11

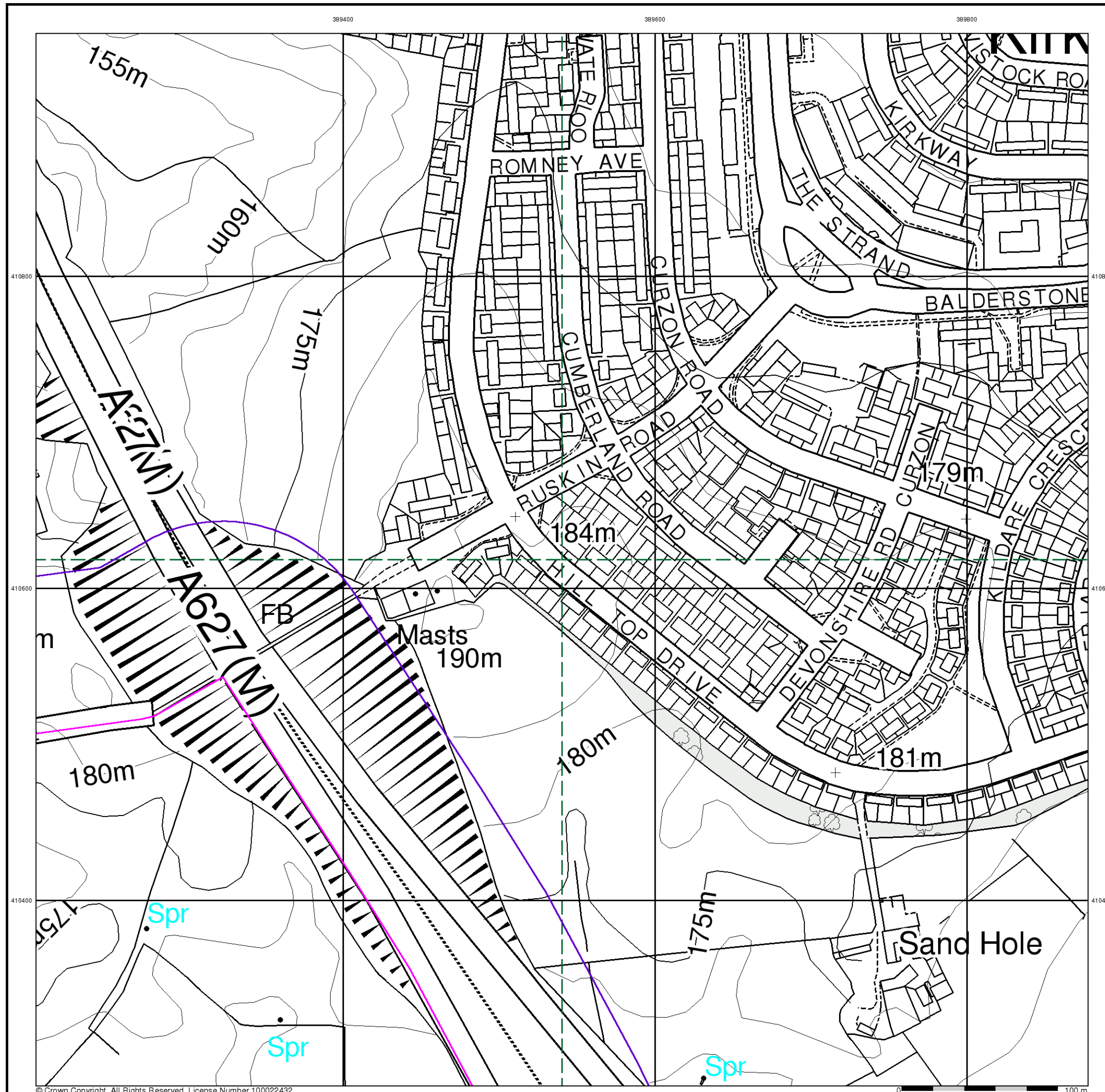


### Order Details

Order Number: 77317590\_1\_1  
Customer Ref: R2228  
National Grid Reference: 389200, 410260  
Slice: A  
Site Area (Ha): 21.43  
Plot Buffer (m): 100

### Site Details

Site at 389190, 410260





## Motion Map Data (1:2,500)

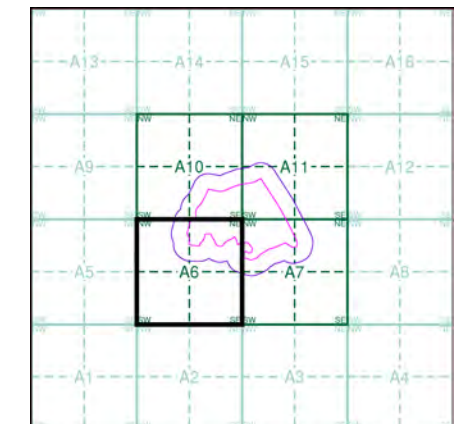
### General

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

### Average Velocity Gradient

- Upward Movement > 3.5mm per year
- Upward Movement 1.5mm to 3.5mm per year
- Stable 1.5mm to -1.5mm per year
- Downward Movement -1.5mm to -3.5mm per year
- Downward Movement > -3.5mm per year

## Mining and Ground Stability - Segment A6

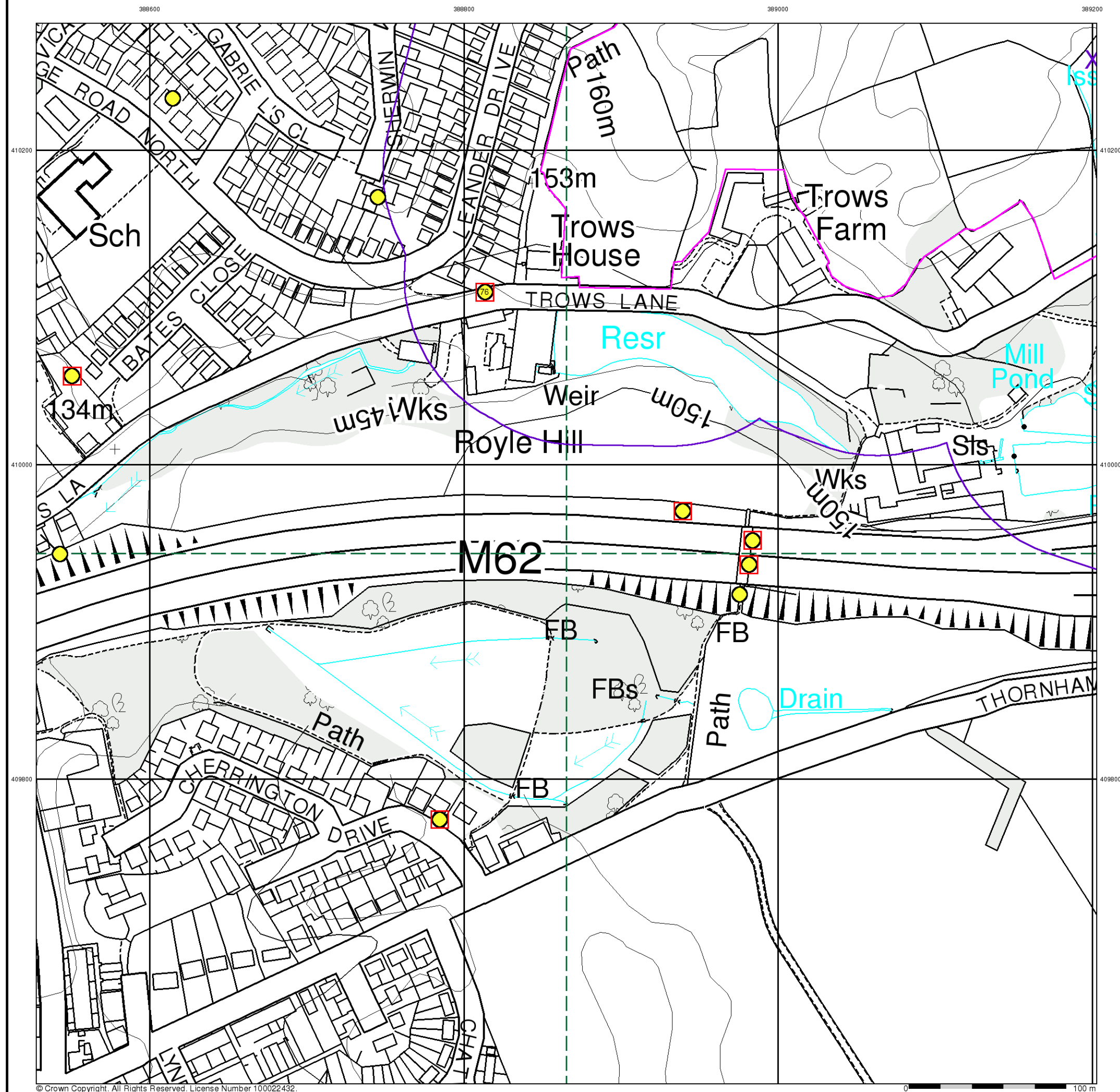


### Order Details

Order Number: 77317590\_1\_1  
 Customer Ref: R2228  
 National Grid Reference: 389200, 410260  
 Slice: A  
 Site Area (Ha): 21.43  
 Plot Buffer (m): 100

### Site Details

Site at 389190, 410260



## Motion Map Data (1:2,500)

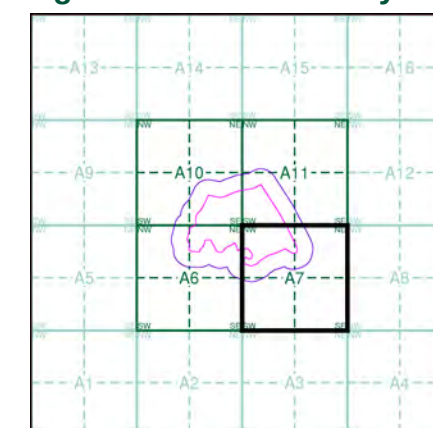
### General

- Specified Site    □ Specified Buffer(s)    X Bearing Reference Point    8 Map ID
- Several of Type at Location

### Average Velocity Gradient

- Upward Movement > 3.5mm per year ●
- Upward Movement 1.5mm to 3.5mm per year ●
- Stable 1.5mm to -1.5mm per year ●
- Downward Movement -1.5mm to -3.5mm per year ●
- Downward Movement > -3.5mm per year ●

## Mining and Ground Stability - Segment A7

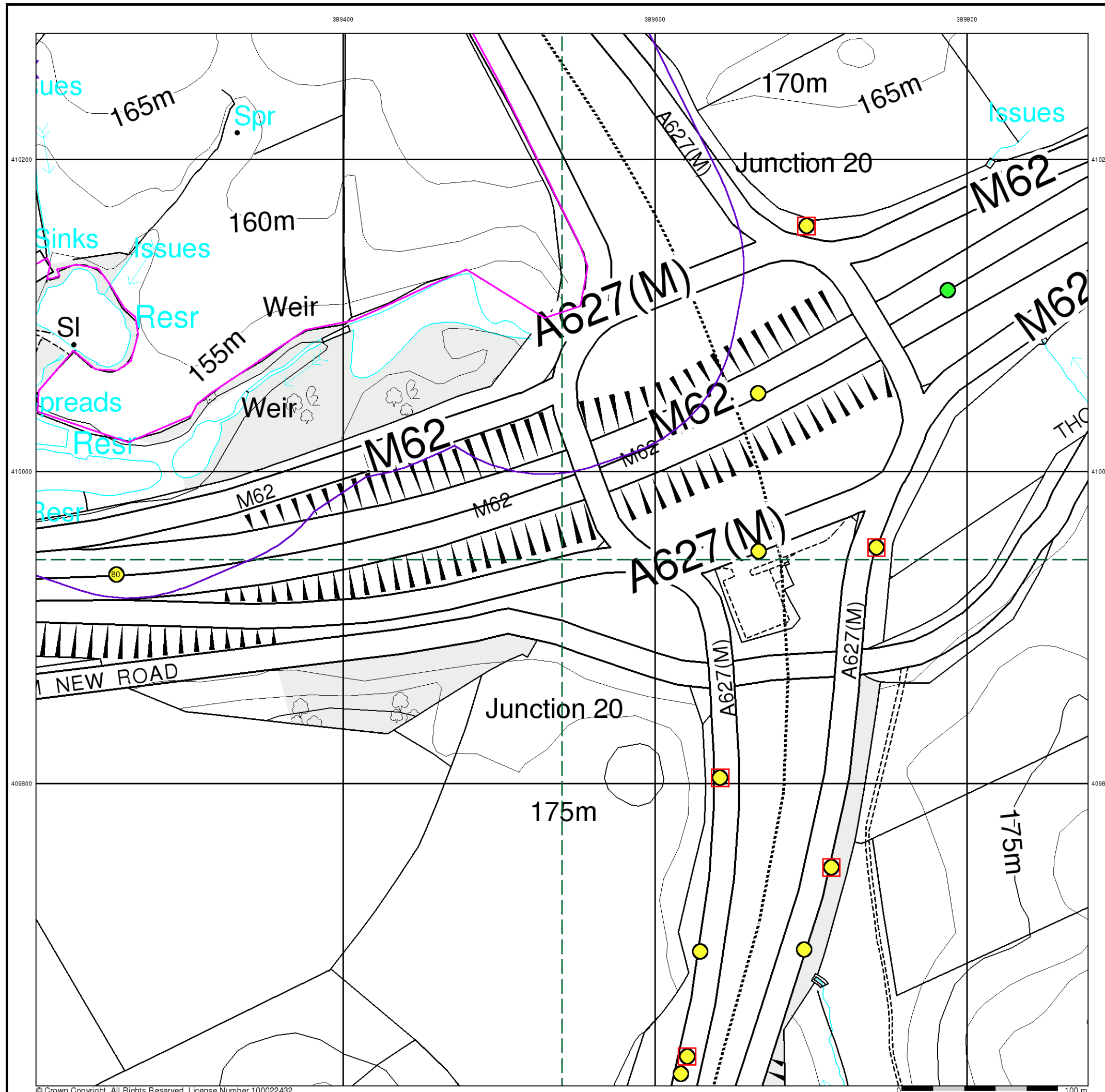


### Order Details

Order Number: 77317590\_1\_1  
 Customer Ref: R2228  
 National Grid Reference: 389200, 410260  
 Slice: A  
 Site Area (Ha): 21.43  
 Plot Buffer (m): 100

### Site Details

Site at 389190, 410260





## Motion Map Data (1:2,500)

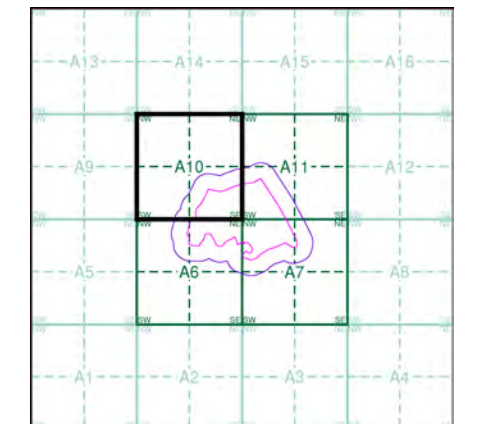
### General

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

### Average Velocity Gradient

- Upward Movement > 3.5mm per year ●
- Upward Movement 1.5mm to 3.5mm per year ●
- Stable 1.5mm to -1.5mm per year ●
- Downward Movement -1.5mm to -3.5mm per year ●
- Downward Movement > -3.5mm per year ●

## Mining and Ground Stability - Segment A10

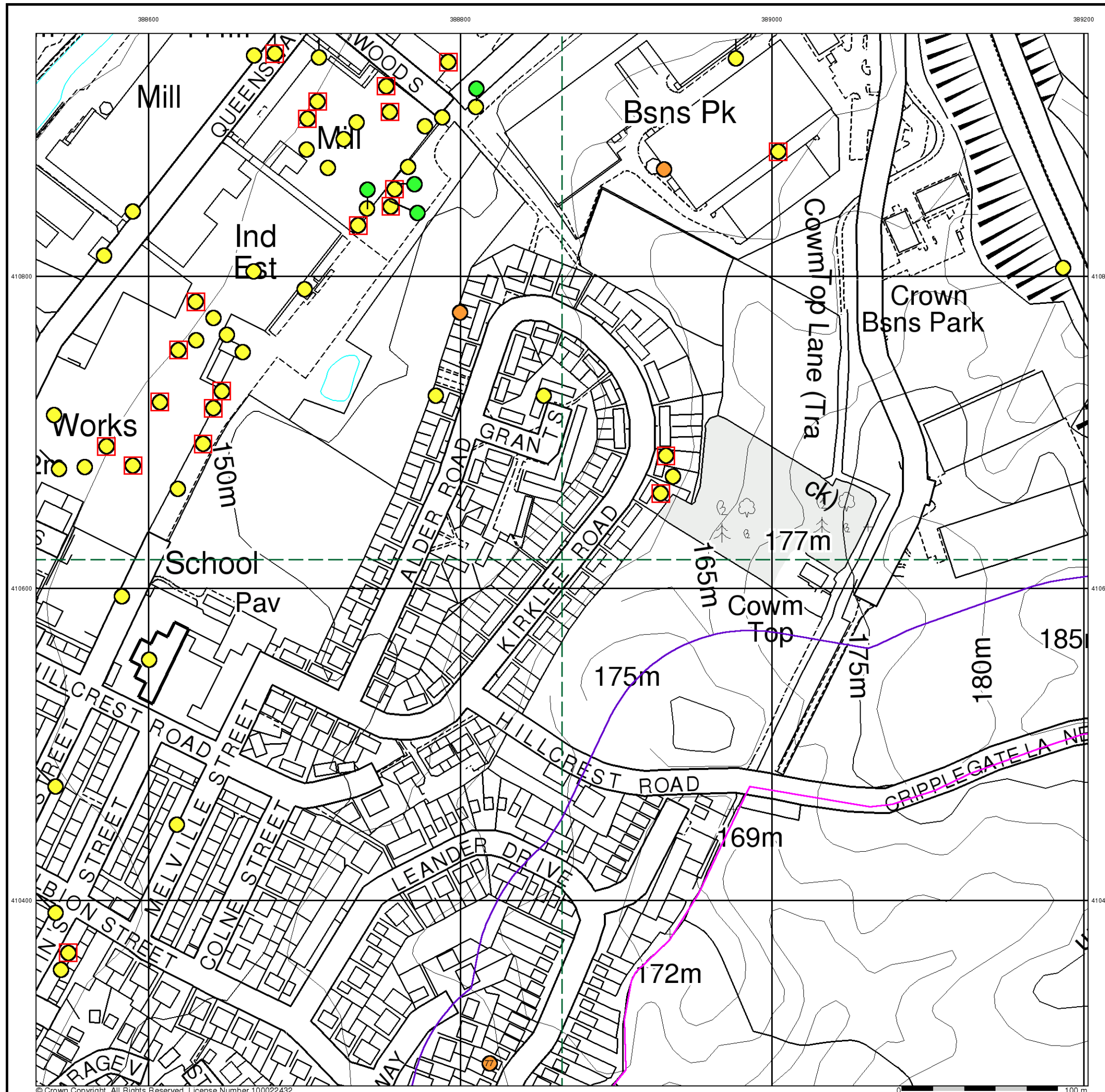


### Order Details

Order Number: 77317590\_1\_1  
 Customer Ref: R2228  
 National Grid Reference: 389200, 410260  
 Slice: A  
 Site Area (Ha): 21.43  
 Plot Buffer (m): 100

### Site Details

Site at 389190, 410260





## Motion Map Data (1:2,500)

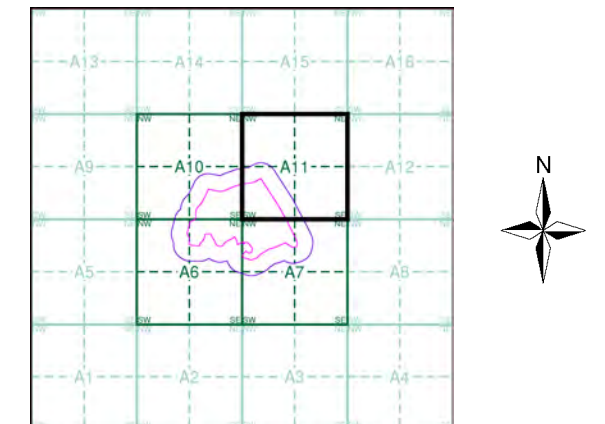
### General

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

### Average Velocity Gradient

- Upward Movement > 3.5mm per year ●
- Upward Movement 1.5mm to 3.5mm per year ●
- Stable 1.5mm to -1.5mm per year ●
- Downward Movement -1.5mm to -3.5mm per year ●
- Downward Movement > -3.5mm per year ●

## Mining and Ground Stability - Segment A11

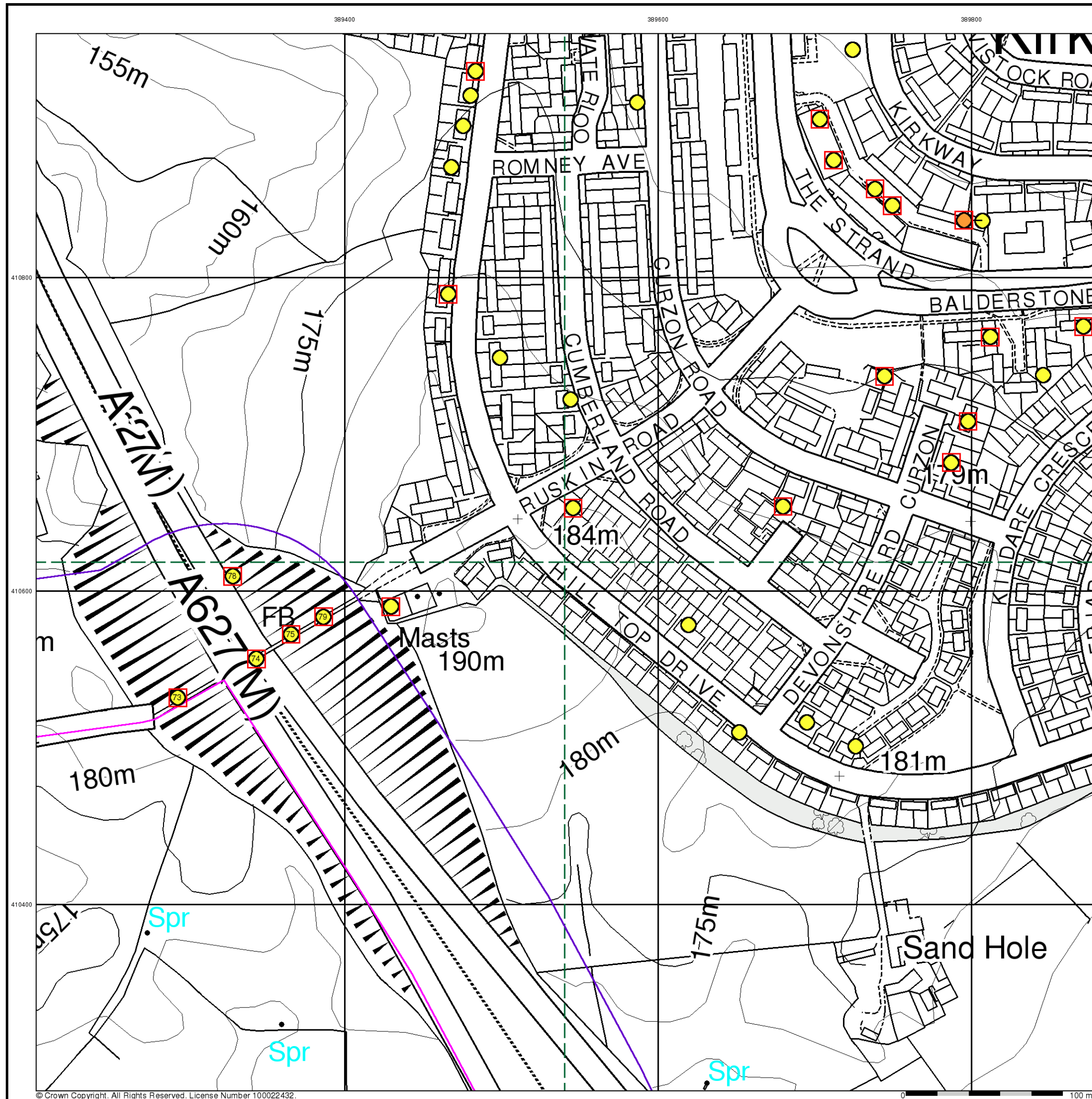


### Order Details

Order Number: 77317590\_1\_1  
 Customer Ref: R2228  
 National Grid Reference: 389200, 410260  
 Slice: A  
 Site Area (Ha): 21.43  
 Plot Buffer (m): 100

### Site Details

Site at 389190, 410260







## Historical Land Use Information (1:10,000)

### General

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

### Potentially Contaminative Industrial Uses (Past Land Uses - Mining)

|                                                               | Point | Line | Polygon |
|---------------------------------------------------------------|-------|------|---------|
| Air Shafts                                                    |       |      |         |
| Disturbed Ground                                              |       |      |         |
| General Quarrying                                             |       |      |         |
| Heap, unknown constituents                                    |       |      |         |
| Mineral Railway                                               |       |      |         |
| Mining and Quarrying General                                  |       |      |         |
| Mining of Coal & Lignite                                      |       |      |         |
| Quarrying of Sand and Clay, Operation of Sand and Gravel Pits |       |      |         |

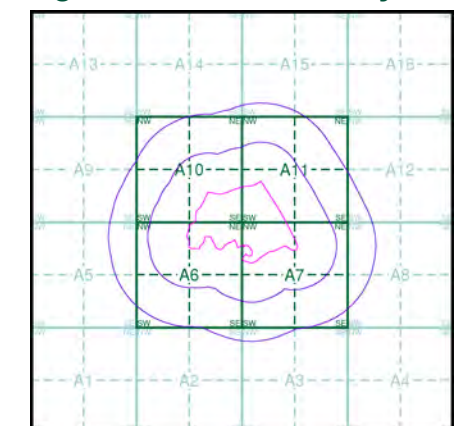
### Historical Land Use

|                                       | Point | Line | Polygon |
|---------------------------------------|-------|------|---------|
| Potentially Infilled Land (Non-Water) |       |      |         |
| Potentially Infilled Land (Water)     |       |      |         |
| Former Marsh                          |       |      |         |

### Mining Data

- Potential Mining Area  
 BGS Recorded Mineral Site

## Mining and Ground Stability - Slice A



### Order Details

Order Number: 77317590\_1\_1  
Customer Ref: R2228  
National Grid Reference: 389200, 410260  
Slice: A  
Site Area (Ha): 21.43  
Search Buffer (m): 500

### Site Details

Site at 389190, 410260



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





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## Ground Stability Data (1:50,000)

### General

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

### Potential for Compressible Ground Stability Hazards

- High
- Moderate
- Low
- Very Low

### Potential for Collapsible Ground Stability Hazards

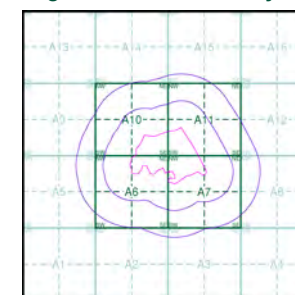
- High
- Moderate
- Low
- Very Low

### Brine Pumping and Salt Mining

- Brine Pumping Related Feature
- Salt Mining Related Feature

- | Point | Polygon |
|-------|---------|
|       |         |
|       |         |

### Mining and Ground Stability - Slice A



### Order Details

Order Number: 77317590\_1\_1  
 Customer Ref: R2228  
 National Grid Reference: 389200, 410260  
 Slice: A  
 Site Area (Ha): 21.43  
 Search Buffer (m): 500

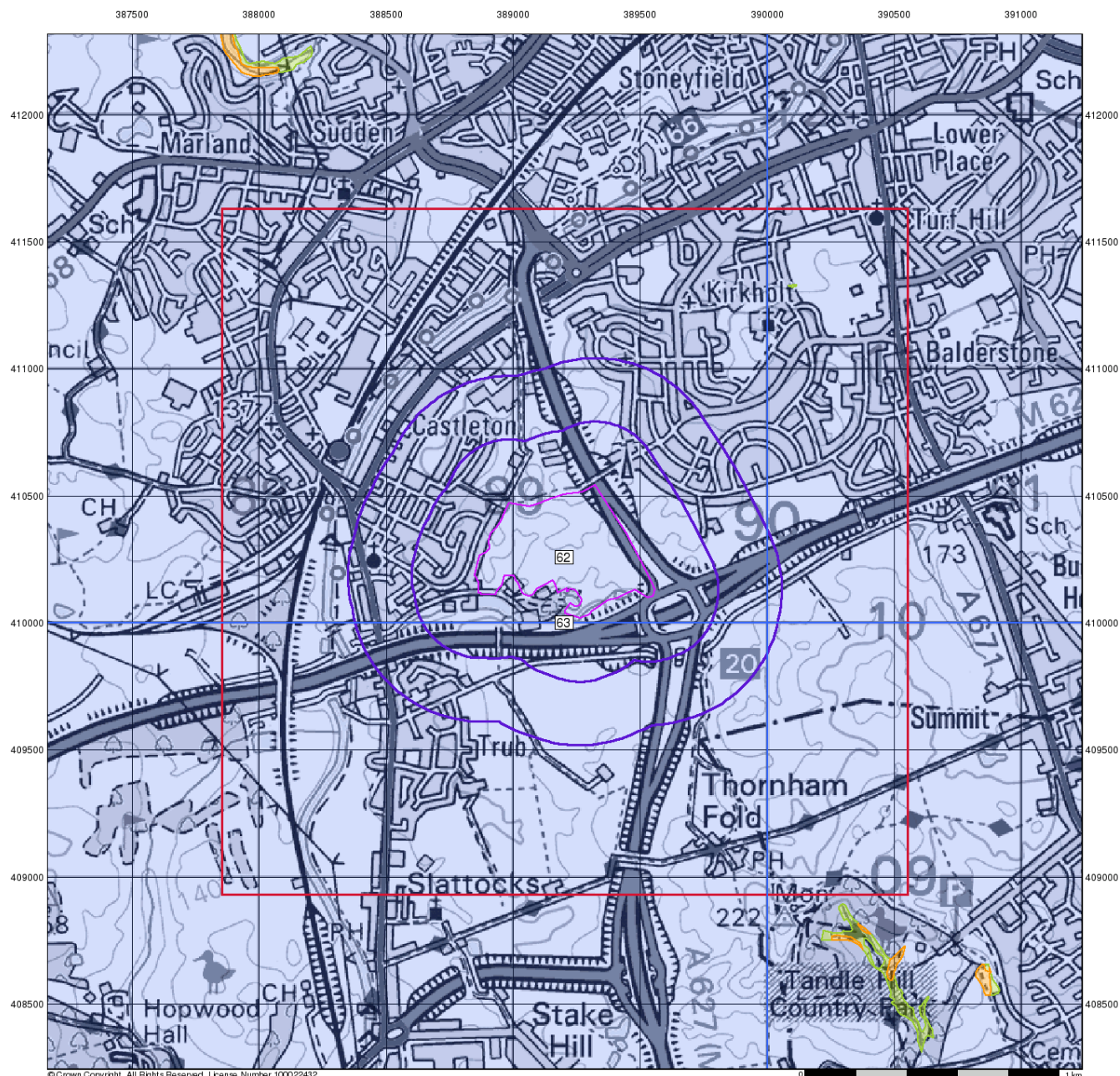
### Site Details

Site at 389190, 410260



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





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## Ground Stability Data (1:50,000)

### General

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

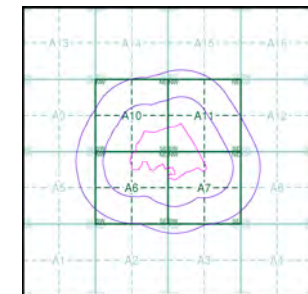
### Potential for Landslide Ground Stability Hazards

- High
- Low
- Moderate
- Very Low

### Potential for Ground Dissolution Stability Hazards

- High
- Low
- Moderate
- Very Low

### Mining and Ground Stability - Slice A



### Order Details

Order Number: 77317590\_1\_1  
 Customer Ref: R2228  
 National Grid Reference: 389200, 410260  
 Slice: A  
 Site Area (Ha): 21.43  
 Search Buffer (m): 500

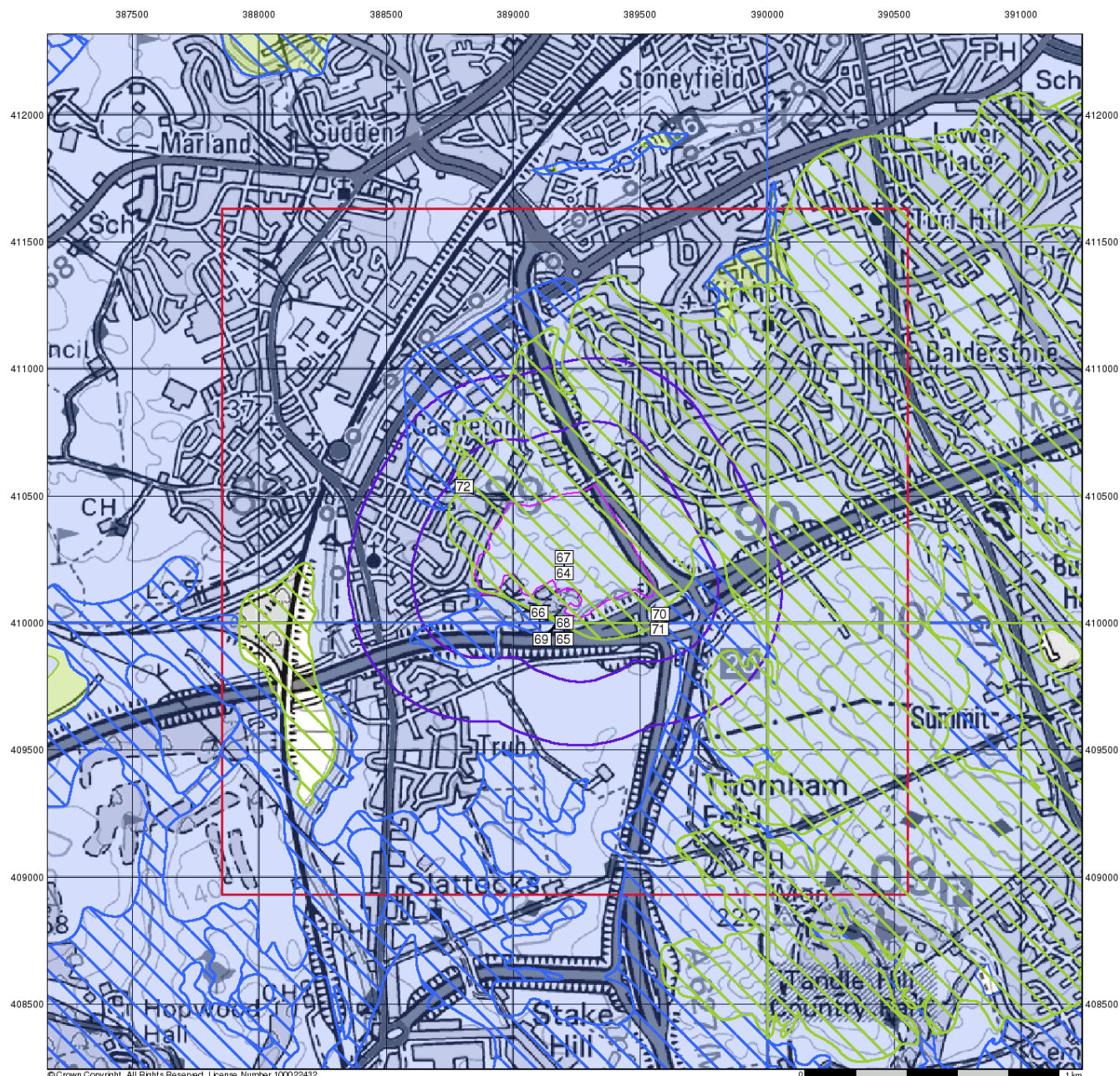
### Site Details

Site at 389190, 410260



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





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## Ground Stability Data (1:50,000)

### General

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

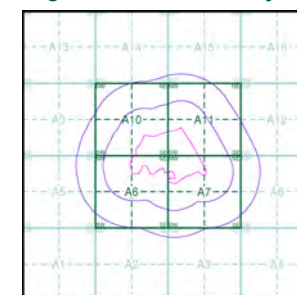
### Potential for Running Sand Ground Stability Hazards

- High
- Low
- Moderate
- Very Low

### Potential for Shrinking or Swelling Clay Ground Stability Hazards

- High
- Low
- Moderate
- Very Low

### Mining and Ground Stability - Slice A



### Order Details

Order Number: 77317590\_1\_1  
 Customer Ref: R2228  
 National Grid Reference: 389200, 410260  
 Slice: A  
 Site Area (Ha): 21.43  
 Search Buffer (m): 500

### Site Details

Site at 389190, 410260



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

## **APPENDIX D**

### **Coal Authority Report**

Issued by:

The Coal Authority, Property Search Services, 200 Lichfield Lane, Berry Hill, Mansfield, Nottinghamshire, NG18 4RG  
Website: [www.groundstability.com](http://www.groundstability.com) Phone: 0345 762 6848 DX 716176 MANSFIELD 5

**LANDMARK INFORMATION GROUP  
LIMITED  
SOWTON INDUSTRIAL ESTATE  
ABBAY COURT  
UNIT 5/7 EAGLE WAY  
EXETER  
DEVON  
EX2 7HY**

Our reference: **51001057857001**  
Your reference: **77317590\_2|**  
Date of your enquiry: **22 December 2015**  
Date we received your enquiry: **22 December 2015**  
Date of issue: **22 December 2015**

This report is for the property described in the address below and the attached plan.

**Non-Residential Coal Authority Mining Report**

**SITE AT 389190, 410260, GREATER MANCHESTER,**

This report is based on and limited to the records held by, the Coal Authority, and the Cheshire Brine Subsidence Compensation Board's records, at the time we answer the search.

|                             |                    |
|-----------------------------|--------------------|
| Coal mining                 | See comments below |
| Brine Compensation District | No                 |

***Information from the Coal Authority***

**Underground coal mining**

**Past**

According to the records in our possession, the property is not within the zone of likely physical influence on the surface from past underground workings.

**Present**

The property is not in the likely zone of influence of any present underground coal workings.

**Future**

The property is not in an area for which the Coal Authority is determining whether to grant a licence to remove coal using underground methods.

The property is not in an area for which a licence has been granted to remove or otherwise work coal using underground methods.

The property is not in an area that is likely to be affected at the surface from any planned future workings.

However, reserves of coal exist in the local area which could be worked at some time in the future.

No notice of the risk of the land being affected by subsidence has been given under section 46 of the Coal Mining Subsidence Act 1991.

### **Mine entries**

There are no known coal mine entries within, or within 20 metres of, the boundary of the property.

### **Coal mining geology**

The Authority is not aware of any evidence of damage arising due to geological faults or other lines of weakness that have been affected by coal mining.

### **Opencast coal mining**

#### **Past**

The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

#### **Present**

The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

#### **Future**

The property is not within 800 metres of the boundary of an opencast site for which the Coal Authority is determining whether to grant a licence to remove coal by opencast methods.

The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

### **Coal mining subsidence**

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres, since 31st October 1994.

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

The 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.

### **Mine gas**

There is no record of a mine gas emission requiring action by the Coal Authority within the boundary of the property.

### **Hazards related to coal mining**

The property has not been subject to remedial works, by or on behalf of the Authority, under its Emergency Surface Hazard Call Out procedures.

### **Withdrawal of support**

The property is not in an area for which a notice of entitlement to withdraw support has been published.

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

### **Working facilities orders**

The property is not in an area for which an Order has been made under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

### **Payments to owners of former copyhold land**

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



## **Comments on Coal Authority information**

In view of the mining circumstances a prudent developer would seek appropriate technical advice before any works are undertaken.

Therefore if development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply good engineering practice developed for mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or mines of coal without the permission of the Coal Authority. Developers should be aware that the investigation of coal seams/former mines of coal may have the potential to generate and/or displace underground gases and these risks both under and adjacent to the development should be fully considered in developing any proposals. The need for effective measures to prevent gases entering into public properties either during investigation or after development also needs to be assessed and properly addressed. This is necessary due to the public safety implications of any development in these circumstances.

## ***Information from the Cheshire Brine Subsidence Compensation Board***

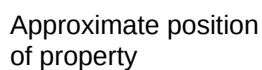
The property lies outside the Cheshire Brine Compensation District.

## ***Additional Remarks***

Information provided by the Coal Authority in this report is compiled in response to the Law Society's Con29M Coal Mining and Brine Subsidence Claim enquiries. The said enquiries are protected by copyright owned by the Law Society of 113 Chancery Lane, London WC2A 1PL. Please note that Brine Subsidence Claim enquiries are only relevant for England and Wales. This report is prepared in accordance with the Law Society's Guidance Notes 2006, the User Guide 2006 and the Coal Authority and Cheshire Brine Board's Terms and Conditions applicable at the time the report was produced.

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### ***Location map***

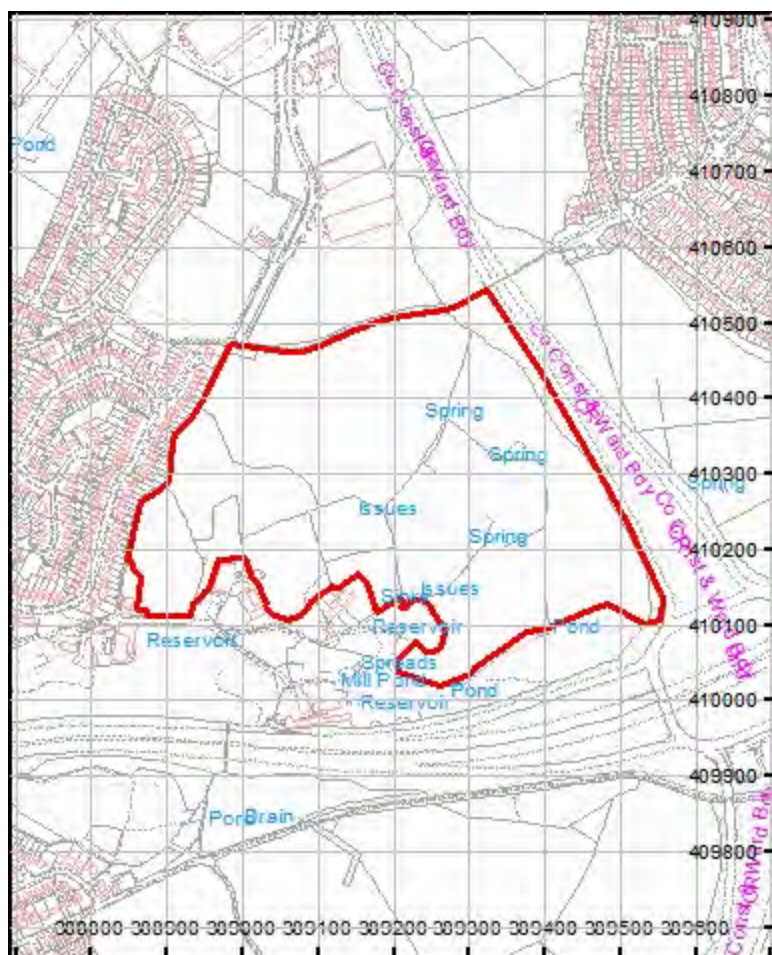


### ***Enquiry boundary***

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Ordnance Survey Licence number: 100020315

## Key

Approximate position of enquiry boundary shown



## **APPENDIX E**

### **Environmental Laboratory Testing Results**



# Jones Environmental Laboratory

Registered Address : Unit 3 Deeside Point, Zone 3, Deeside Industrial Park, Deeside, CH5 2UA. UK

Unit 3 Deeside Point  
Zone 3  
Deeside Industrial Park  
Deeside  
CH5 2UA

Smith Grant LLP  
Station House  
Station Road  
Ruabon  
Wrexham  
LL14 6DL

Tel: +44 (0) 1244 833780

Fax: +44 (0) 1244 833781



**Attention :** Ben Thomas  
**Date :** 15th July, 2016  
**Your reference :** R2228  
**Our reference :** Test Report 16/11018 Batch 1  
**Location :** Throws Farm Rochdale  
**Date samples received :** 30th June, 2016  
**Status :** Final report  
**Issue :** 1

Twenty one samples were received for analysis on 30th June, 2016 of which twenty one were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied. All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

**Compiled By:**

**Phil Sommerton BSc**  
**Project Manager**



# Jones Environmental Laboratory

**Client Name:** Smith Grant LLP  
**Reference:** R2228  
**Location:** Throws Farm Rochdale  
**Contact:** Ben Thomas  
**JE Job No.:** 16/11018

**Report : Solid**

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

| J E Sample No.                     | 1-2        | 3-4                | 5          | 6          | 7-8                | 9          | 10-11              | 12-13               | 14         | 15-16              | Please see attached notes for all abbreviations and acronyms |       |                    |
|------------------------------------|------------|--------------------|------------|------------|--------------------|------------|--------------------|---------------------|------------|--------------------|--------------------------------------------------------------|-------|--------------------|
| Sample ID                          | TP02J1     | TP03J1             | TP03D      | TP05D      | TP06J1             | TP07D      | TP07J1             | TP08J1              | TP08D      | TP11J1             |                                                              |       |                    |
| Depth                              | 0.20       | 0.30               | 1.30       | 0.60       | 0.10               | 0.60       | 0.10               | 0.20                | 0.70       | 0.10               |                                                              |       |                    |
| COC No / misc                      |            |                    |            |            |                    |            |                    |                     |            |                    |                                                              |       |                    |
| Containers                         | V J        | V J                | T          | T          | V J                | T          | V J                | V J                 | T          | V J                |                                                              |       |                    |
| Sample Date                        | 28/06/2016 | 28/06/2016         | 28/06/2016 | 28/06/2016 | 28/06/2016         | 28/06/2016 | 28/06/2016         | 28/06/2016          | 28/06/2016 | 29/06/2016         |                                                              |       |                    |
| Sample Type                        | Soil       | Soil               | Soil       | Soil       | Soil               | Soil       | Soil               | Soil                | Soil       | Soil               |                                                              |       |                    |
| Batch Number                       | 1          | 1                  | 1          | 1          | 1                  | 1          | 1                  | 1                   | 1          | 1                  |                                                              |       |                    |
| Date of Receipt                    | 30/06/2016 | 30/06/2016         | 30/06/2016 | 30/06/2016 | 30/06/2016         | 30/06/2016 | 30/06/2016         | 30/06/2016          | 30/06/2016 | 30/06/2016         | LOD/LOR                                                      | Units | Method No.         |
| Arsenic <sup>#M</sup>              | 21.7       | 21.1               | -          | -          | 22.2               | -          | 27.0               | 98.9                | -          | 30.9               | <0.5                                                         | mg/kg | TM30/PM15          |
| Cadmium <sup>#M</sup>              | 5.3        | <0.1               | -          | -          | 0.4                | -          | 0.1                | 2.0                 | -          | 0.5                | <0.1                                                         | mg/kg | TM30/PM15          |
| Chromium <sup>#M</sup>             | 98.8       | 53.9               | -          | -          | 109.9              | -          | 113.9              | 529.4 <sup>AB</sup> | -          | 119.1              | <0.5                                                         | mg/kg | TM30/PM15          |
| Copper <sup>#M</sup>               | 92         | 492 <sup>AA</sup>  | -          | -          | 107                | -          | 48                 | 1011 <sup>AB</sup>  | -          | 93                 | <1                                                           | mg/kg | TM30/PM15          |
| Lead <sup>#M</sup>                 | 145        | 672                | -          | -          | 284                | -          | 122                | 887                 | -          | 200                | <5                                                           | mg/kg | TM30/PM15          |
| Mercury <sup>#M</sup>              | 0.4        | <0.1               | -          | -          | <0.1               | -          | 0.2                | 0.4                 | -          | 0.5                | <0.1                                                         | mg/kg | TM30/PM15          |
| Nickel <sup>#M</sup>               | 21.1       | 61.1               | -          | -          | 16.1               | -          | 22.1               | 168.1               | -          | 19.6               | <0.7                                                         | mg/kg | TM30/PM15          |
| Selenium <sup>#M</sup>             | 1          | <1                 | -          | -          | 2                  | -          | 2                  | 3                   | -          | 2                  | <1                                                           | mg/kg | TM30/PM15          |
| Zinc <sup>#M</sup>                 | 539        | 124                | -          | -          | 86                 | -          | 92                 | 872                 | -          | 104                | <5                                                           | mg/kg | TM30/PM15          |
| PAH MS                             |            |                    |            |            |                    |            |                    |                     |            |                    |                                                              |       |                    |
| Naphthalene <sup>#M</sup>          | <0.04      | <0.04              | -          | -          | <0.04              | -          | <0.04              | <0.20 <sup>AA</sup> | -          | <0.04              | <0.04                                                        | mg/kg | TM4/PM8            |
| Acenaphthylene                     | <0.03      | <0.03              | -          | -          | <0.03              | -          | <0.03              | <0.15 <sup>AA</sup> | -          | <0.03              | <0.03                                                        | mg/kg | TM4/PM8            |
| Acenaphthene <sup>#M</sup>         | <0.05      | <0.05              | -          | -          | <0.05              | -          | <0.05              | <0.25 <sup>AA</sup> | -          | <0.05              | <0.05                                                        | mg/kg | TM4/PM8            |
| Fluorene <sup>#M</sup>             | <0.04      | <0.04              | -          | -          | <0.04              | -          | <0.04              | <0.20 <sup>AA</sup> | -          | <0.04              | <0.04                                                        | mg/kg | TM4/PM8            |
| Phenanthrene <sup>#M</sup>         | 0.32       | <0.03              | -          | -          | 0.14               | -          | 0.13               | 0.38 <sup>AA</sup>  | -          | 0.20               | <0.03                                                        | mg/kg | TM4/PM8            |
| Anthracene <sup>#</sup>            | 0.07       | <0.04              | -          | -          | <0.04              | -          | <0.04              | <0.20 <sup>AA</sup> | -          | <0.04              | <0.04                                                        | mg/kg | TM4/PM8            |
| Fluoranthene <sup>#M</sup>         | 0.58       | <0.03              | -          | -          | 0.29               | -          | 0.28               | 0.40 <sup>AA</sup>  | -          | 0.49               | <0.03                                                        | mg/kg | TM4/PM8            |
| Pyrene <sup>#</sup>                | 0.52       | <0.03              | -          | -          | 0.26               | -          | 0.27               | 0.69 <sup>AA</sup>  | -          | 0.46               | <0.03                                                        | mg/kg | TM4/PM8            |
| Benzo(a)anthracene <sup>#</sup>    | 0.35       | <0.06              | -          | -          | 0.14               | -          | 0.22               | <0.30 <sup>AA</sup> | -          | 0.33               | <0.06                                                        | mg/kg | TM4/PM8            |
| Chrysene <sup>#M</sup>             | 0.29       | <0.02              | -          | -          | 0.17               | -          | 0.16               | 0.59 <sup>AA</sup>  | -          | 0.29               | <0.02                                                        | mg/kg | TM4/PM8            |
| Benzo(b)fluoranthene <sup>#M</sup> | 0.48       | <0.07              | -          | -          | 0.28               | -          | 0.28               | 0.77 <sup>AA</sup>  | -          | 0.51               | <0.07                                                        | mg/kg | TM4/PM8            |
| Benzo(a)pyrene <sup>#</sup>        | 0.28       | <0.04              | -          | -          | 0.16               | -          | 0.16               | 0.46 <sup>AA</sup>  | -          | 0.28               | <0.04                                                        | mg/kg | TM4/PM8            |
| Indeno(123cd)pyrene <sup>#M</sup>  | 0.19       | <0.04              | -          | -          | 0.10               | -          | 0.12               | 0.51 <sup>AA</sup>  | -          | 0.20               | <0.04                                                        | mg/kg | TM4/PM8            |
| Dibenzo(ah)anthracene <sup>#</sup> | 0.05       | <0.04              | -          | -          | <0.04              | -          | <0.04              | <0.20 <sup>AA</sup> | -          | <0.04              | <0.04                                                        | mg/kg | TM4/PM8            |
| Benzo(ghi)perylene <sup>#</sup>    | 0.19       | <0.04              | -          | -          | 0.10               | -          | 0.10               | 0.49 <sup>AA</sup>  | -          | 0.18               | <0.04                                                        | mg/kg | TM4/PM8            |
| PAH 16 Total                       | 3.3        | <0.6               | -          | -          | 1.6                | -          | 1.7                | 4.3 <sup>AA</sup>   | -          | 2.9                | <0.6                                                         | mg/kg | TM4/PM8            |
| Benzo(b)fluoranthene               | 0.35       | <0.05              | -          | -          | 0.20               | -          | 0.20               | 0.55 <sup>AA</sup>  | -          | 0.37               | <0.05                                                        | mg/kg | TM4/PM8            |
| Benzo(k)fluoranthene               | 0.13       | <0.02              | -          | -          | 0.08               | -          | 0.08               | 0.22 <sup>AA</sup>  | -          | 0.14               | <0.02                                                        | mg/kg | TM4/PM8            |
| PAH Surrogate % Recovery           | 104        | 100                | -          | -          | 102                | -          | 110                | 98 <sup>AA</sup>    | -          | 106                | <0                                                           | %     | TM4/PM8            |
| TPH CWG                            |            |                    |            |            |                    |            |                    |                     |            |                    |                                                              |       |                    |
| Aliphatics                         |            |                    |            |            |                    |            |                    |                     |            |                    |                                                              |       |                    |
| >C5-C6 <sup>#M</sup>               | <0.1       | <0.1 <sup>SV</sup> | -          | -          | <0.1 <sup>SV</sup> | -          | <0.1 <sup>SV</sup> | <0.1 <sup>SV</sup>  | -          | <0.1 <sup>SV</sup> | <0.1                                                         | mg/kg | TM36/PM12          |
| >C6-C8 <sup>#M</sup>               | <0.1       | <0.1 <sup>SV</sup> | -          | -          | <0.1 <sup>SV</sup> | -          | <0.1 <sup>SV</sup> | <0.1 <sup>SV</sup>  | -          | <0.1 <sup>SV</sup> | <0.1                                                         | mg/kg | TM36/PM12          |
| >C8-C10                            | <0.1       | <0.1 <sup>SV</sup> | -          | -          | <0.1 <sup>SV</sup> | -          | <0.1 <sup>SV</sup> | <0.1 <sup>SV</sup>  | -          | <0.1 <sup>SV</sup> | <0.1                                                         | mg/kg | TM36/PM12          |
| >C10-C12 <sup>#M</sup>             | <0.2       | <0.2               | -          | -          | <0.2               | -          | <0.2               | <0.2                | -          | <0.2               | <0.2                                                         | mg/kg | TM5/PM16           |
| >C12-C16 <sup>#M</sup>             | <4         | <4                 | -          | -          | <4                 | -          | <4                 | <4                  | -          | <4                 | <4                                                           | mg/kg | TM5/PM16           |
| >C16-C21 <sup>#M</sup>             | <7         | <7                 | -          | -          | <7                 | -          | <7                 | 155                 | -          | <7                 | <7                                                           | mg/kg | TM5/PM16           |
| >C21-C35 <sup>#M</sup>             | <7         | <7                 | -          | -          | <7                 | -          | <7                 | 1504                | -          | <7                 | <7                                                           | mg/kg | TM5/PM16           |
| Total aliphatics C5-35             | <19        | <19                | -          | -          | <19                | -          | <19                | 1659                | -          | <19                | <19                                                          | mg/kg | TM5/PM16;TM42/PM16 |

Please see attached notes for all abbreviations and acronyms

**Client Name:** Smith Grant LLP  
**Reference:** R2228  
**Location:** Throws Farm Rochdale  
**Contact:** Ben Thomas  
**JE Job No.:** 16/11018

**Report : Solid**

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

| J E Sample No.                     | 17         | 18         | 19-20              | 21         | 22-23              | 24         | 25-26      | 27         | 28         | 29         | Please see attached notes for all abbreviations and acronyms |       |            |
|------------------------------------|------------|------------|--------------------|------------|--------------------|------------|------------|------------|------------|------------|--------------------------------------------------------------|-------|------------|
| Sample ID                          | TP11D      | TP12D      | TP13J1             | TP13D      | TP15J1             | TP15D      | TP17J1     | TP17D      | TP20D      | TP21D      |                                                              |       |            |
| Depth                              | 1.60       | 0.90       | 0.30               | 3.00       | 0.30               | 1.30       | 0.10       | 1.10       | 1.00       | 1.50       |                                                              |       |            |
| COC No / misc                      |            |            |                    |            |                    |            |            |            |            |            |                                                              |       |            |
| Containers                         | T          | T          | V J                | T          | V J                | T          | V J        | T          | T          | T          |                                                              |       |            |
| Sample Date                        | 29/06/2016 | 29/06/2016 | 29/06/2016         | 29/06/2016 | 29/06/2016         | 29/06/2016 | 29/06/2016 | 29/06/2016 | 30/06/2016 | 30/06/2016 |                                                              |       |            |
| Sample Type                        | Soil       | Soil       | Soil               | Soil       | Soil               | Soil       | Soil       | Soil       | Soil       | Soil       |                                                              |       |            |
| Batch Number                       | 1          | 1          | 1                  | 1          | 1                  | 1          | 1          | 1          | 1          | 1          |                                                              |       |            |
| Date of Receipt                    | 30/06/2016 | 30/06/2016 | 30/06/2016         | 30/06/2016 | 30/06/2016         | 30/06/2016 | 30/06/2016 | 30/06/2016 | 30/06/2016 | 30/06/2016 | LOD/LOR                                                      | Units | Method No. |
| Arsenic <sup>#M</sup>              | -          | -          | 5.1                | -          | 41.2               | -          | 20.4       | -          | -          | -          | <0.5                                                         | mg/kg | TM30/PM15  |
| Cadmium <sup>#M</sup>              | -          | -          | <0.1               | -          | <0.1               | -          | 0.6        | -          | -          | -          | <0.1                                                         | mg/kg | TM30/PM15  |
| Chromium <sup>#M</sup>             | -          | -          | 62.3               | -          | 91.6               | -          | 138.0      | -          | -          | -          | <0.5                                                         | mg/kg | TM30/PM15  |
| Copper <sup>#M</sup>               | -          | -          | 17                 | -          | 53                 | -          | 90         | -          | -          | -          | <1                                                           | mg/kg | TM30/PM15  |
| Lead <sup>#M</sup>                 | -          | -          | 21                 | -          | 116                | -          | 118        | -          | -          | -          | <5                                                           | mg/kg | TM30/PM15  |
| Mercury <sup>#M</sup>              | -          | -          | <0.1               | -          | 0.2                | -          | 0.2        | -          | -          | -          | <0.1                                                         | mg/kg | TM30/PM15  |
| Nickel <sup>#M</sup>               | -          | -          | 27.1               | -          | 18.9               | -          | 21.1       | -          | -          | -          | <0.7                                                         | mg/kg | TM30/PM15  |
| Selenium <sup>#M</sup>             | -          | -          | <1                 | -          | 2                  | -          | 2          | -          | -          | -          | <1                                                           | mg/kg | TM30/PM15  |
| Zinc <sup>#M</sup>                 | -          | -          | 64                 | -          | 46                 | -          | 124        | -          | -          | -          | <5                                                           | mg/kg | TM30/PM15  |
| PAH MS                             |            |            |                    |            |                    |            |            |            |            |            |                                                              |       |            |
| Naphthalene <sup>#M</sup>          | -          | -          | <0.04              | -          | <0.04              | -          | <0.04      | -          | -          | -          | <0.04                                                        | mg/kg | TM4/PM8    |
| Acenaphthylene                     | -          | -          | <0.03              | -          | <0.03              | -          | <0.03      | -          | -          | -          | <0.03                                                        | mg/kg | TM4/PM8    |
| Acenaphthene <sup>#M</sup>         | -          | -          | <0.05              | -          | <0.05              | -          | <0.05      | -          | -          | -          | <0.05                                                        | mg/kg | TM4/PM8    |
| Fluorene <sup>#M</sup>             | -          | -          | <0.04              | -          | <0.04              | -          | <0.04      | -          | -          | -          | <0.04                                                        | mg/kg | TM4/PM8    |
| Phenanthrene <sup>#M</sup>         | -          | -          | 0.03               | -          | 0.12               | -          | 1.02       | -          | -          | -          | <0.03                                                        | mg/kg | TM4/PM8    |
| Anthracene <sup>#</sup>            | -          | -          | <0.04              | -          | <0.04              | -          | 0.20       | -          | -          | -          | <0.04                                                        | mg/kg | TM4/PM8    |
| Fluoranthene <sup>#M</sup>         | -          | -          | 0.03               | -          | 0.28               | -          | 1.91       | -          | -          | -          | <0.03                                                        | mg/kg | TM4/PM8    |
| Pyrene <sup>#</sup>                | -          | -          | 0.03               | -          | 0.26               | -          | 1.58       | -          | -          | -          | <0.03                                                        | mg/kg | TM4/PM8    |
| Benzo(a)anthracene <sup>#</sup>    | -          | -          | <0.06              | -          | 0.21               | -          | 0.91       | -          | -          | -          | <0.06                                                        | mg/kg | TM4/PM8    |
| Chrysene <sup>#M</sup>             | -          | -          | 0.02               | -          | 0.17               | -          | 0.96       | -          | -          | -          | <0.02                                                        | mg/kg | TM4/PM8    |
| Benzo(b)fluoranthene <sup>#M</sup> | -          | -          | <0.07              | -          | 0.30               | -          | 1.33       | -          | -          | -          | <0.07                                                        | mg/kg | TM4/PM8    |
| Benzo(a)pyrene <sup>#</sup>        | -          | -          | <0.04              | -          | 0.16               | -          | 0.75       | -          | -          | -          | <0.04                                                        | mg/kg | TM4/PM8    |
| Indeno(123cd)pyrene <sup>#M</sup>  | -          | -          | <0.04              | -          | 0.10               | -          | 0.44       | -          | -          | -          | <0.04                                                        | mg/kg | TM4/PM8    |
| Dibenzo(ah)anthracene <sup>#</sup> | -          | -          | <0.04              | -          | <0.04              | -          | 0.11       | -          | -          | -          | <0.04                                                        | mg/kg | TM4/PM8    |
| Benzo(ghi)perylene <sup>#</sup>    | -          | -          | <0.04              | -          | 0.10               | -          | 0.47       | -          | -          | -          | <0.04                                                        | mg/kg | TM4/PM8    |
| PAH 16 Total                       | -          | -          | <0.6               | -          | 1.7                | -          | 9.7        | -          | -          | -          | <0.6                                                         | mg/kg | TM4/PM8    |
| Benzo(b)fluoranthene               | -          | -          | <0.05              | -          | 0.22               | -          | 0.96       | -          | -          | -          | <0.05                                                        | mg/kg | TM4/PM8    |
| Benzo(k)fluoranthene               | -          | -          | <0.02              | -          | 0.08               | -          | 0.37       | -          | -          | -          | <0.02                                                        | mg/kg | TM4/PM8    |
| PAH Surrogate % Recovery           | -          | -          | 106                | -          | 104                | -          | 105        | -          | -          | -          | <0                                                           | %     | TM4/PM8    |
| TPH CWG                            |            |            |                    |            |                    |            |            |            |            |            |                                                              |       |            |
| Aliphatics                         |            |            |                    |            |                    |            |            |            |            |            |                                                              |       |            |
| >C5-C6 <sup>#M</sup>               | -          | -          | <0.1 <sup>SV</sup> | -          | <0.1 <sup>SV</sup> | -          | <0.1       | -          | -          | -          | <0.1                                                         | mg/kg | TM36/PM12  |
| >C6-C8 <sup>#M</sup>               | -          | -          | <0.1 <sup>SV</sup> | -          | <0.1 <sup>SV</sup> | -          | <0.1       | -          | -          | -          | <0.1                                                         | mg/kg | TM36/PM12  |
| >C8-C10                            | -          | -          | <0.1 <sup>SV</sup> | -          | <0.1 <sup>SV</sup> | -          | <0.1       | -          | -          | -          | <0.1                                                         | mg/kg | TM36/PM12  |
| >C10-C12 <sup>#M</sup>             | -          | -          | <0.2               | -          | <0.2               | -          | <0.2       | -          | -          | -          | <0.2                                                         | mg/kg | TM5/PM16   |
| >C12-C16 <sup>#M</sup>             | -          | -          | <4                 | -          | <4                 | -          | <4         | -          | -          | -          | <4                                                           | mg/kg | TM5/PM16   |
| >C16-C21 <sup>#M</sup>             | -          | -          | <7                 | -          | <7                 | -          | <7         | -          | -          | -          | <7                                                           | mg/kg | TM5/PM16   |
| >C21-C35 <sup>#M</sup>             | -          | -          | <7                 | -          | <7                 | -          | <7         | -          | -          | -          | <7                                                           | mg/kg | TM5/PM16   |
| Total aliphatics C5-35             | -          | -          | <19                | -          | <19                | -          | <19        | -          | -          | -          | <19                                                          | mg/kg | TM5/PM16   |

Please see attached notes for all abbreviations and acronyms



**Client Name:** Smith Grant LLP  
**Reference:** R2228  
**Location:** Throws Farm Rochdale  
**Contact:** Ben Thomas  
**JE Job No.:** 16/11018

**Report : Solid**

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

|                                     |                    |  |  |  |  |  |  |  |  |  |                                                              |       |                    |
|-------------------------------------|--------------------|--|--|--|--|--|--|--|--|--|--------------------------------------------------------------|-------|--------------------|
| <b>J E Sample No.</b>               | 30-31              |  |  |  |  |  |  |  |  |  | Please see attached notes for all abbreviations and acronyms |       |                    |
| <b>Sample ID</b>                    | TP18J1             |  |  |  |  |  |  |  |  |  |                                                              |       |                    |
| <b>Depth</b>                        | 0.10               |  |  |  |  |  |  |  |  |  |                                                              |       |                    |
| <b>COC No / misc</b>                |                    |  |  |  |  |  |  |  |  |  |                                                              |       |                    |
| <b>Containers</b>                   | V J                |  |  |  |  |  |  |  |  |  |                                                              |       |                    |
| <b>Sample Date</b>                  | 29/06/2016         |  |  |  |  |  |  |  |  |  |                                                              |       |                    |
| <b>Sample Type</b>                  | Soil               |  |  |  |  |  |  |  |  |  |                                                              |       |                    |
| <b>Batch Number</b>                 | 1                  |  |  |  |  |  |  |  |  |  |                                                              |       |                    |
| <b>Date of Receipt</b>              | 30/06/2016         |  |  |  |  |  |  |  |  |  | LOD/LOR                                                      | Units | Method No.         |
| Arsenic <sup>#M</sup>               | 19.8               |  |  |  |  |  |  |  |  |  | <0.5                                                         | mg/kg | TM30/PM15          |
| Cadmium <sup>#M</sup>               | 0.2                |  |  |  |  |  |  |  |  |  | <0.1                                                         | mg/kg | TM30/PM15          |
| Chromium <sup>#M</sup>              | 115.5              |  |  |  |  |  |  |  |  |  | <0.5                                                         | mg/kg | TM30/PM15          |
| Copper <sup>#M</sup>                | 45                 |  |  |  |  |  |  |  |  |  | <1                                                           | mg/kg | TM30/PM15          |
| Lead <sup>#M</sup>                  | 109                |  |  |  |  |  |  |  |  |  | <5                                                           | mg/kg | TM30/PM15          |
| Mercury <sup>#M</sup>               | 0.3                |  |  |  |  |  |  |  |  |  | <0.1                                                         | mg/kg | TM30/PM15          |
| Nickel <sup>#M</sup>                | 20.0               |  |  |  |  |  |  |  |  |  | <0.7                                                         | mg/kg | TM30/PM15          |
| Selenium <sup>#M</sup>              | 2                  |  |  |  |  |  |  |  |  |  | <1                                                           | mg/kg | TM30/PM15          |
| Zinc <sup>#M</sup>                  | 117                |  |  |  |  |  |  |  |  |  | <5                                                           | mg/kg | TM30/PM15          |
| PAH MS                              |                    |  |  |  |  |  |  |  |  |  |                                                              |       |                    |
| Naphthalene <sup>#M</sup>           | <0.04              |  |  |  |  |  |  |  |  |  | <0.04                                                        | mg/kg | TM4/PM8            |
| Acenaphthylene                      | <0.03              |  |  |  |  |  |  |  |  |  | <0.03                                                        | mg/kg | TM4/PM8            |
| Acenaphthene <sup>#M</sup>          | <0.05              |  |  |  |  |  |  |  |  |  | <0.05                                                        | mg/kg | TM4/PM8            |
| Fluorene <sup>#M</sup>              | <0.04              |  |  |  |  |  |  |  |  |  | <0.04                                                        | mg/kg | TM4/PM8            |
| Phenanthrene <sup>#M</sup>          | 0.10               |  |  |  |  |  |  |  |  |  | <0.03                                                        | mg/kg | TM4/PM8            |
| Anthracene #                        | <0.04              |  |  |  |  |  |  |  |  |  | <0.04                                                        | mg/kg | TM4/PM8            |
| Fluoranthene <sup>#M</sup>          | 0.23               |  |  |  |  |  |  |  |  |  | <0.03                                                        | mg/kg | TM4/PM8            |
| Pyrene #                            | 0.23               |  |  |  |  |  |  |  |  |  | <0.03                                                        | mg/kg | TM4/PM8            |
| Benzo(a)anthracene #                | 0.19               |  |  |  |  |  |  |  |  |  | <0.06                                                        | mg/kg | TM4/PM8            |
| Chrysene <sup>#M</sup>              | 0.16               |  |  |  |  |  |  |  |  |  | <0.02                                                        | mg/kg | TM4/PM8            |
| Benzo(bk)fluoranthene <sup>#M</sup> | 0.29               |  |  |  |  |  |  |  |  |  | <0.07                                                        | mg/kg | TM4/PM8            |
| Benzo(a)pyrene #                    | 0.16               |  |  |  |  |  |  |  |  |  | <0.04                                                        | mg/kg | TM4/PM8            |
| Indeno(123cd)pyrene <sup>#M</sup>   | 0.13               |  |  |  |  |  |  |  |  |  | <0.04                                                        | mg/kg | TM4/PM8            |
| Dibenzo(ah)anthracene #             | <0.04              |  |  |  |  |  |  |  |  |  | <0.04                                                        | mg/kg | TM4/PM8            |
| Benzo(ghi)perylene #                | 0.12               |  |  |  |  |  |  |  |  |  | <0.04                                                        | mg/kg | TM4/PM8            |
| PAH 16 Total                        | 1.6                |  |  |  |  |  |  |  |  |  | <0.6                                                         | mg/kg | TM4/PM8            |
| Benzo(b)fluoranthene                | 0.21               |  |  |  |  |  |  |  |  |  | <0.05                                                        | mg/kg | TM4/PM8            |
| Benzo(k)fluoranthene                | 0.08               |  |  |  |  |  |  |  |  |  | <0.02                                                        | mg/kg | TM4/PM8            |
| PAH Surrogate % Recovery            | 99                 |  |  |  |  |  |  |  |  |  | <0                                                           | %     | TM4/PM8            |
| TPH CWG                             |                    |  |  |  |  |  |  |  |  |  |                                                              |       |                    |
| <b>Aliphatics</b>                   |                    |  |  |  |  |  |  |  |  |  |                                                              |       |                    |
| >C5-C6 <sup>#M</sup>                | <0.1 <sup>SV</sup> |  |  |  |  |  |  |  |  |  | <0.1                                                         | mg/kg | TM36/PM12          |
| >C6-C8 <sup>#M</sup>                | <0.1 <sup>SV</sup> |  |  |  |  |  |  |  |  |  | <0.1                                                         | mg/kg | TM36/PM12          |
| >C8-C10                             | <0.1 <sup>SV</sup> |  |  |  |  |  |  |  |  |  | <0.1                                                         | mg/kg | TM36/PM12          |
| >C10-C12 <sup>#M</sup>              | <0.2               |  |  |  |  |  |  |  |  |  | <0.2                                                         | mg/kg | TM5/PM16           |
| >C12-C16 <sup>#M</sup>              | <4                 |  |  |  |  |  |  |  |  |  | <4                                                           | mg/kg | TM5/PM16           |
| >C16-C21 <sup>#M</sup>              | <7                 |  |  |  |  |  |  |  |  |  | <7                                                           | mg/kg | TM5/PM16           |
| >C21-C35 <sup>#M</sup>              | <7                 |  |  |  |  |  |  |  |  |  | <7                                                           | mg/kg | TM5/PM16           |
| Total aliphatics C5-35              | <19                |  |  |  |  |  |  |  |  |  | <19                                                          | mg/kg | TM5/PM16/PM12/PM15 |

Please see attached notes for all abbreviations and acronyms

**Client Name:** Smith Grant LLP  
**Reference:** R2228  
**Location:** Throws Farm Rochdale  
**Contact:** Ben Thomas

**Note:**

Analysis was carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:



Ryan Butterworth  
 Asbestos Team Leader

| J E Job No. | Batch | Sample ID | Depth | J E Sample No. | Date Of Analysis | Analysis                            | Result                 |
|-------------|-------|-----------|-------|----------------|------------------|-------------------------------------|------------------------|
| 16/11018    | 1     | TP02J1    | 0.20  | 2              | 05/07/2016       | General Description (Bulk Analysis) | soil/stones            |
|             |       |           |       |                | 05/07/2016       | Asbestos Fibres                     | NAD                    |
|             |       |           |       |                | 05/07/2016       | Asbestos Fibres (2)                 | NAD                    |
|             |       |           |       |                | 05/07/2016       | Asbestos ACM                        | NAD                    |
|             |       |           |       |                | 05/07/2016       | Asbestos ACM (2)                    | NAD                    |
|             |       |           |       |                | 05/07/2016       | Asbestos Type                       | NAD                    |
|             |       |           |       |                | 05/07/2016       | Asbestos Type (2)                   | NAD                    |
|             |       |           |       |                | 05/07/2016       | Asbestos Level Screen               | NAD                    |
| 16/11018    | 1     | TP03J1    | 0.30  | 4              | 05/07/2016       | General Description (Bulk Analysis) | soil/stones            |
|             |       |           |       |                | 05/07/2016       | Asbestos Fibres                     | NAD                    |
|             |       |           |       |                | 05/07/2016       | Asbestos Fibres (2)                 | NAD                    |
|             |       |           |       |                | 05/07/2016       | Asbestos ACM                        | NAD                    |
|             |       |           |       |                | 05/07/2016       | Asbestos ACM (2)                    | NAD                    |
|             |       |           |       |                | 05/07/2016       | Asbestos Type                       | NAD                    |
|             |       |           |       |                | 05/07/2016       | Asbestos Type (2)                   | NAD                    |
|             |       |           |       |                | 05/07/2016       | Asbestos Level Screen               | NAD                    |
| 16/11018    | 1     | TP06J1    | 0.10  | 8              | 06/07/2016       | General Description (Bulk Analysis) | soil-stones            |
|             |       |           |       |                | 06/07/2016       | Asbestos Fibres                     | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Fibres (2)                 | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos ACM                        | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos ACM (2)                    | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Type                       | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Type (2)                   | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Level Screen               | NAD                    |
| 16/11018    | 1     | TP07J1    | 0.10  | 11             | 06/07/2016       | General Description (Bulk Analysis) | soil-stones            |
|             |       |           |       |                | 06/07/2016       | Asbestos Fibres                     | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Fibres (2)                 | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos ACM                        | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos ACM (2)                    | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Type                       | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Type (2)                   | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Level Screen               | NAD                    |
| 16/11018    | 1     | TP08J1    | 0.20  | 13             | 06/07/2016       | General Description (Bulk Analysis) | soil-stones-vegetation |
|             |       |           |       |                | 06/07/2016       | Asbestos Fibres                     | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Fibres (2)                 | NAD                    |

**Client Name:** Smith Grant LLP  
**Reference:** R2228  
**Location:** Throws Farm Rochdale  
**Contact:** Ben Thomas

| J E Job No. | Batch | Sample ID | Depth | J E Sample No. | Date Of Analysis | Analysis                            | Result                 |
|-------------|-------|-----------|-------|----------------|------------------|-------------------------------------|------------------------|
| 16/11018    | 1     | TP08J1    | 0.20  | 13             | 06/07/2016       | Asbestos ACM                        | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos ACM (2)                    | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Type                       | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Type (2)                   | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Level Screen               | NAD                    |
| 16/11018    | 1     | TP11J1    | 0.10  | 16             | 06/07/2016       | General Description (Bulk Analysis) | soil-stones-vegetation |
|             |       |           |       |                | 06/07/2016       | Asbestos Fibres                     | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Fibres (2)                 | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos ACM                        | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos ACM (2)                    | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Type                       | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Type (2)                   | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Level Screen               | NAD                    |
| 16/11018    | 1     | TP13J1    | 0.30  | 20             | 05/07/2016       | General Description (Bulk Analysis) | Soil/Stone             |
|             |       |           |       |                | 05/07/2016       | Asbestos Fibres                     | NAD                    |
|             |       |           |       |                | 05/07/2016       | Asbestos Fibres (2)                 | NAD                    |
|             |       |           |       |                | 05/07/2016       | Asbestos ACM                        | NAD                    |
|             |       |           |       |                | 05/07/2016       | Asbestos ACM (2)                    | NAD                    |
|             |       |           |       |                | 05/07/2016       | Asbestos Type                       | NAD                    |
|             |       |           |       |                | 05/07/2016       | Asbestos Type (2)                   | NAD                    |
|             |       |           |       |                | 05/07/2016       | Asbestos Level Screen               | NAD                    |
| 16/11018    | 1     | TP15J1    | 0.30  | 23             | 06/07/2016       | General Description (Bulk Analysis) | Soil/Stones            |
|             |       |           |       |                | 06/07/2016       | Asbestos Fibres                     | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Fibres (2)                 | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos ACM                        | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos ACM (2)                    | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Type                       | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Type (2)                   | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Level Screen               | NAD                    |
| 16/11018    | 1     | TP17J1    | 0.10  | 26             | 06/07/2016       | General Description (Bulk Analysis) | Soil/Stones            |
|             |       |           |       |                | 06/07/2016       | Asbestos Fibres                     | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Fibres (2)                 | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos ACM                        | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos ACM (2)                    | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Type                       | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Type (2)                   | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Level Screen               | NAD                    |
| 16/11018    | 1     | TP18J1    | 0.10  | 31             | 06/07/2016       | General Description (Bulk Analysis) | Soil/Stones            |
|             |       |           |       |                | 06/07/2016       | Asbestos Fibres                     | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Fibres (2)                 | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos ACM                        | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos ACM (2)                    | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Type                       | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Type (2)                   | NAD                    |
|             |       |           |       |                | 06/07/2016       | Asbestos Level Screen               | NAD                    |



**Matrix : Solid**

[illegible]

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## NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 16/11018

### SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

### WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 (UKAS) accreditation applies to surface water and groundwater and one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

### DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

### SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

### DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

### NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

**ABBREVIATIONS and ACRONYMS USED**

|         |                                                                                                            |
|---------|------------------------------------------------------------------------------------------------------------|
| #       | ISO17025 (UKAS) accredited - UK.                                                                           |
| B       | Indicates analyte found in associated method blank.                                                        |
| DR      | Dilution required.                                                                                         |
| M       | MCERTS accredited.                                                                                         |
| NA      | Not applicable                                                                                             |
| NAD     | No Asbestos Detected.                                                                                      |
| ND      | None Detected (usually refers to VOC and/SVOC TICs).                                                       |
| NDP     | No Determination Possible                                                                                  |
| SS      | Calibrated against a single substance                                                                      |
| SV      | Surrogate recovery outside performance criteria. This may be due to a matrix effect.                       |
| W       | Results expressed on as received basis.                                                                    |
| +       | AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page. |
| ++      | Result outside calibration range, results should be considered as indicative only and are not accredited.  |
| *       | Analysis subcontracted to a Jones Environmental approved laboratory.                                       |
| AD      | Samples are dried at 35°C ±5°C                                                                             |
| CO      | Suspected carry over                                                                                       |
| LOD/LOR | Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS                                  |
| ME      | Matrix Effect                                                                                              |
| NFD     | No Fibres Detected                                                                                         |
| BS      | AQC Sample                                                                                                 |
| LB      | Blank Sample                                                                                               |
| N       | Client Sample                                                                                              |
| TB      | Trip Blank Sample                                                                                          |
| OC      | Outside Calibration Range                                                                                  |
| AA      | x5 Dilution                                                                                                |
| AB      | x10 Dilution                                                                                               |

JE Job No: 16/11018

| Test Method No. | Description                                                                                                                                                                                                                                                                                                                                                                    | Prep Method No. (if appropriate) | Description                                                                                                                                          | ISO 17025 (UKAS) | MCERTS (UK soils only) | Analysis done on As Received (AR) or Dried (AD) | Reported on dry weight basis |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------------|-------------------------------------------------|------------------------------|
| PM4             | Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.                                                                                                                                                                                                                                 | PM0                              | No preparation is required.                                                                                                                          |                  |                        |                                                 |                              |
| TM4             | Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.                                                                                                                                                                                                                                                                                   | PM8                              | End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.                                |                  |                        | AR                                              | Yes                          |
| TM4             | Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.                                                                                                                                                                                                                                                                                   | PM8                              | End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.                                | Yes              |                        | AR                                              | Yes                          |
| TM4             | Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.                                                                                                                                                                                                                                                                                   | PM8                              | End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.                                | Yes              | Yes                    | AR                                              | Yes                          |
| TM5             | Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.                                                                                                                                                                                                                      | PM16                             | Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.                                                                         |                  |                        | AR                                              | Yes                          |
| TM5             | Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.                                                                                                                                                                                                                      | PM16                             | Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.                                                                         | Yes              | Yes                    | AR                                              | Yes                          |
| TM5/TM36        | TM005: Modified USEPA 8015B. Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID.<br>TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of | PM12/PM16                        | CWG GC-FID                                                                                                                                           |                  |                        | AR                                              | Yes                          |
| PM13            | A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.                                                                                                                                                                                                                  | PM0                              | No preparation is required.                                                                                                                          |                  |                        | AR                                              |                              |
| TM21            | Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection.                                                                                                                                                               | PM24                             | Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis. |                  |                        | AD                                              | Yes                          |
| TM30            | Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7 and 6010B                                                                                                                                                                                                                          | PM15                             | Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.        | Yes              | Yes                    | AD                                              | Yes                          |



JE Job No: 16/11018

| Test Method No. | Description                                                                                                                             | Prep Method No. (if appropriate) | Description                                                                                                                                                                                                                                                        | ISO 17025 (UKAS) | MCERTS (UK soils only) | Analysis done on As Received (AR) or Dried (AD) | Reported on dry weight basis |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------------|-------------------------------------------------|------------------------------|
| TM31            | Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.             | PM12                             | Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.                                                                                                                                                                    |                  |                        | AR                                              | Yes                          |
| TM31            | Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.             | PM12                             | Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.                                                                                                                                                                    | Yes              |                        | AR                                              | Yes                          |
| TM36            | Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.    | PM12                             | Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.                                                                                                                                                                    |                  |                        | AR                                              | Yes                          |
| TM36            | Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.    | PM12                             | Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.                                                                                                                                                                    | Yes              | Yes                    | AR                                              | Yes                          |
| TM38            | Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1 | PM20                             | Extraction of dried and ground samples with deionised water in a 2:1 water to solid ratio for anions. Extraction of as received samples with deionised water in a 2:1 water to solid ratio for ammoniacal nitrogen. Samples are extracted using an orbital shaker. | Yes              | Yes                    | AD                                              | Yes                          |
| TM38            | Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1 | PM20                             | Extraction of dried and ground samples with deionised water in a 2:1 water to solid ratio for anions. Extraction of as received samples with deionised water in a 2:1 water to solid ratio for ammoniacal nitrogen. Samples are extracted using an orbital shaker. | Yes              |                        | AR                                              | Yes                          |
| TM65            | Asbestos Bulk Identification method based on HSG 248.                                                                                   | PM42                             | Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.                                                                                                                                               |                  |                        | AR                                              |                              |
| TM65            | Asbestos Bulk Identification method based on HSG 248.                                                                                   | PM42                             | Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.                                                                                                                                               | Yes              |                        | AR                                              |                              |
| TM73            | Modified US EPA methods 150.1 and 9045D. Determination of pH by Metrohm automated probe analyser.                                       | PM11                             | Extraction of as received solid samples using one part solid to 2.5 parts deionised water.                                                                                                                                                                         | Yes              | Yes                    | AR                                              | No                           |
| NONE            | No Method Code                                                                                                                          | NONE                             | No Method Code                                                                                                                                                                                                                                                     |                  |                        | AR                                              | Yes                          |



# Jones Environmental Laboratory

Registered Address : Unit 3 Deeside Point, Zone 3, Deeside Industrial Park, Deeside, CH5 2UA. UK

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|                                |                              |
|--------------------------------|------------------------------|
| <b>Attention :</b>             | Ben Thomas                   |
| <b>Date :</b>                  | 13th July, 2016              |
| <b>Your reference :</b>        | R2228                        |
| <b>Our reference :</b>         | Test Report 16/10975 Batch 1 |
| <b>Location :</b>              | Trows Farm                   |
| <b>Date samples received :</b> | 30th June, 2016              |
| <b>Status :</b>                | Final report                 |
| <b>Issue :</b>                 | 1                            |

Three samples were received for analysis on 30th June, 2016 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

**Compiled By:**

**Phil Sommerton BSc**  
**Project Manager**

**Client Name:** Smith Grant LLP  
**Reference:** R2228  
**Location:** Trows Farm  
**Contact:** Ben Thomas  
**JE Job No.:** 16/10975

**Report : Liquid**

**Liquids/products:** V=40ml vial, G=glass bottle, P=plastic bottle  
H=H<sub>2</sub>SO<sub>4</sub>, Z=ZnAc, N=NaOH, HN=HN0<sub>3</sub>

[illegible]

Client Name: Smith Grant LLP  
 Reference: R2228  
 Location: Trows Farm  
 Contact: Ben Thomas  
 JE Job No.: 16/10975

SVOC Report : Liquid

| J E Sample No.              | 1-3          | 4-6          | 7-9          |  |  |  |  |  |  |      |      |           |
|-----------------------------|--------------|--------------|--------------|--|--|--|--|--|--|------|------|-----------|
| Sample ID                   | SPRING 1     | SPRING 2     | SUPPLY       |  |  |  |  |  |  |      |      |           |
| Depth                       |              |              |              |  |  |  |  |  |  |      |      |           |
| COC No / misc               |              |              |              |  |  |  |  |  |  |      |      |           |
| Containers                  | V G          | V G          | V G          |  |  |  |  |  |  |      |      |           |
| Sample Date                 | 28/06/2016   | 28/06/2016   | 28/06/2016   |  |  |  |  |  |  |      |      |           |
| Sample Type                 | Ground Water | Ground Water | Ground Water |  |  |  |  |  |  |      |      |           |
| Batch Number                | 1            | 1            | 1            |  |  |  |  |  |  |      |      |           |
| Date of Receipt             | 30/06/2016   | 30/06/2016   | 30/06/2016   |  |  |  |  |  |  |      |      |           |
|                             | LOD/LOR      | Units        | Method No.   |  |  |  |  |  |  |      |      |           |
| SVOC MS                     |              |              |              |  |  |  |  |  |  |      |      |           |
| <b>Phenols</b>              |              |              |              |  |  |  |  |  |  |      |      |           |
| 2-Chlorophenol #            | <1           | <1           | <1           |  |  |  |  |  |  | <1   | ug/l | TM16/PM30 |
| 2-Methylphenol #            | <0.5         | <0.5         | <0.5         |  |  |  |  |  |  | <0.5 | ug/l | TM16/PM30 |
| 2-Nitrophenol               | <0.5         | <0.5         | <0.5         |  |  |  |  |  |  | <0.5 | ug/l | TM16/PM30 |
| 2,4-Dichlorophenol #        | <0.5         | <0.5         | <0.5         |  |  |  |  |  |  | <0.5 | ug/l | TM16/PM30 |
| 2,4-Dimethylphenol          | <1           | <1           | <1           |  |  |  |  |  |  | <1   | ug/l | TM16/PM30 |
| 2,4,5-Trichlorophenol #     | <0.5         | <0.5         | <0.5         |  |  |  |  |  |  | <0.5 | ug/l | TM16/PM30 |
| 2,4,6-Trichlorophenol       | <1           | <1           | <1           |  |  |  |  |  |  | <1   | ug/l | TM16/PM30 |
| 4-Chloro-3-methylphenol #   | <0.5         | <0.5         | <0.5         |  |  |  |  |  |  | <0.5 | ug/l | TM16/PM30 |
| 4-Methylphenol              | <1           | <1           | <1           |  |  |  |  |  |  | <1   | ug/l | TM16/PM30 |
| 4-Nitrophenol               | <10          | <10          | <10          |  |  |  |  |  |  | <10  | ug/l | TM16/PM30 |
| Pentachlorophenol           | <1           | <1           | <1           |  |  |  |  |  |  | <1   | ug/l | TM16/PM30 |
| Phenol                      | <1           | <1           | <1           |  |  |  |  |  |  | <1   | ug/l | TM16/PM30 |
| <b>PAHs</b>                 |              |              |              |  |  |  |  |  |  |      |      |           |
| 2-Chloronaphthalene #       | <1           | <1           | <1           |  |  |  |  |  |  | <1   | ug/l | TM16/PM30 |
| 2-Methylnaphthalene #       | <1           | <1           | <1           |  |  |  |  |  |  | <1   | ug/l | TM16/PM30 |
| Naphthalene #               | <1           | <1           | <1           |  |  |  |  |  |  | <1   | ug/l | TM16/PM30 |
| Acenaphthylene #            | <0.5         | <0.5         | <0.5         |  |  |  |  |  |  | <0.5 | ug/l | TM16/PM30 |
| Acenaphthene #              | <1           | <1           | <1           |  |  |  |  |  |  | <1   | ug/l | TM16/PM30 |
| Fluorene #                  | <0.5         | <0.5         | <0.5         |  |  |  |  |  |  | <0.5 | ug/l | TM16/PM30 |
| Phenanthrene #              | <0.5         | <0.5         | <0.5         |  |  |  |  |  |  | <0.5 | ug/l | TM16/PM30 |
| Anthracene #                | <0.5         | <0.5         | <0.5         |  |  |  |  |  |  | <0.5 | ug/l | TM16/PM30 |
| Fluoranthene #              | <0.5         | <0.5         | <0.5         |  |  |  |  |  |  | <0.5 | ug/l | TM16/PM30 |
| Pyrene #                    | <0.5         | <0.5         | <0.5         |  |  |  |  |  |  | <0.5 | ug/l | TM16/PM30 |
| Benzo(a)anthracene #        | <0.5         | <0.5         | <0.5         |  |  |  |  |  |  | <0.5 | ug/l | TM16/PM30 |
| Chrysene #                  | <0.5         | <0.5         | <0.5         |  |  |  |  |  |  | <0.5 | ug/l | TM16/PM30 |
| Benzo(bk)fluoranthene #     | <1           | <1           | <1           |  |  |  |  |  |  | <1   | ug/l | TM16/PM30 |
| Benzo(a)pyrene              | <1           | <1           | <1           |  |  |  |  |  |  | <1   | ug/l | TM16/PM30 |
| Indeno(123cd)pyrene         | <1           | <1           | <1           |  |  |  |  |  |  | <1   | ug/l | TM16/PM30 |
| Dibenzo(ah)anthracene #     | <0.5         | <0.5         | <0.5         |  |  |  |  |  |  | <0.5 | ug/l | TM16/PM30 |
| Benzo(ghi)perylene #        | <0.5         | <0.5         | <0.5         |  |  |  |  |  |  | <0.5 | ug/l | TM16/PM30 |
| <b>Phthalates</b>           |              |              |              |  |  |  |  |  |  |      |      |           |
| Bis(2-ethylhexyl) phthalate | <5           | <5           | <5           |  |  |  |  |  |  | <5   | ug/l | TM16/PM30 |
| Butylbenzyl phthalate       | <1           | <1           | <1           |  |  |  |  |  |  | <1   | ug/l | TM16/PM30 |
| Di-n-butyl phthalate #      | <1.5         | <1.5         | <1.5         |  |  |  |  |  |  | <1.5 | ug/l | TM16/PM30 |
| Di-n-Octyl phthalate        | <1           | <1           | <1           |  |  |  |  |  |  | <1   | ug/l | TM16/PM30 |
| Diethyl phthalate #         | <1           | <1           | <1           |  |  |  |  |  |  | <1   | ug/l | TM16/PM30 |
| Dimethyl phthalate          | <1           | <1           | <1           |  |  |  |  |  |  | <1   | ug/l | TM16/PM30 |

Please see attached notes for all abbreviations and acronyms



Please see attached notes for all abbreviations and acronyms

Client Name: Smith Grant LLP  
Reference: R2228  
Location: Trows Farm  
Contact: Ben Thomas  
JE Job No.: 16/10975

VOC Report : Liquid

| J E Sample No.                          | 1-3          | 4-6          | 7-9          |  |  |  |  |  |  |      |      |           |
|-----------------------------------------|--------------|--------------|--------------|--|--|--|--|--|--|------|------|-----------|
| Sample ID                               | SPRING 1     | SPRING 2     | SUPPLY       |  |  |  |  |  |  |      |      |           |
| Depth                                   |              |              |              |  |  |  |  |  |  |      |      |           |
| COC No / misc                           |              |              |              |  |  |  |  |  |  |      |      |           |
| Containers                              | V G          | V G          | V G          |  |  |  |  |  |  |      |      |           |
| Sample Date                             | 28/06/2016   | 28/06/2016   | 28/06/2016   |  |  |  |  |  |  |      |      |           |
| Sample Type                             | Ground Water | Ground Water | Ground Water |  |  |  |  |  |  |      |      |           |
| Batch Number                            | 1            | 1            | 1            |  |  |  |  |  |  |      |      |           |
| Date of Receipt                         | 30/06/2016   | 30/06/2016   | 30/06/2016   |  |  |  |  |  |  |      |      |           |
|                                         | LOD/LOR      | Units        | Method No.   |  |  |  |  |  |  |      |      |           |
| VOC MS                                  |              |              |              |  |  |  |  |  |  |      |      |           |
| Dichlorodifluoromethane                 | <2           | <2           | <2           |  |  |  |  |  |  | <2   | ug/l | TM15/PM10 |
| Methyl Tertiary Butyl Ether #           | <0.1         | <0.1         | <0.1         |  |  |  |  |  |  | <0.1 | ug/l | TM15/PM10 |
| Chloromethane #                         | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| Vinyl Chloride #                        | <0.1         | <0.1         | <0.1         |  |  |  |  |  |  | <0.1 | ug/l | TM15/PM10 |
| Bromomethane                            | <1           | <1           | <1           |  |  |  |  |  |  | <1   | ug/l | TM15/PM10 |
| Chloroethane #                          | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| Trichlorofluoromethane #                | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| 1,1-Dichloroethene (1,1 DCE) #          | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| Dichloromethane (DCM) #                 | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| trans-1,2-Dichloroethene #              | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| 1,1-Dichloroethane #                    | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| cis-1,2-Dichloroethene #                | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| 2,2-Dichloropropane                     | <1           | <1           | <1           |  |  |  |  |  |  | <1   | ug/l | TM15/PM10 |
| Bromochloromethane #                    | <2           | <2           | <2           |  |  |  |  |  |  | <2   | ug/l | TM15/PM10 |
| Chloroform #                            | <2           | <2           | <2           |  |  |  |  |  |  | <2   | ug/l | TM15/PM10 |
| 1,1,1-Trichloroethane #                 | <2           | <2           | <2           |  |  |  |  |  |  | <2   | ug/l | TM15/PM10 |
| 1,1,1-Dichloropropene #                 | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| Carbon tetrachloride #                  | <2           | <2           | <2           |  |  |  |  |  |  | <2   | ug/l | TM15/PM10 |
| 1,2-Dichloroethane #                    | <2           | <2           | <2           |  |  |  |  |  |  | <2   | ug/l | TM15/PM10 |
| Benzene #                               | <0.5         | <0.5         | <0.5         |  |  |  |  |  |  | <0.5 | ug/l | TM15/PM10 |
| Trichloroethene (TCE) #                 | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| 1,2-Dichloropropane #                   | <2           | <2           | <2           |  |  |  |  |  |  | <2   | ug/l | TM15/PM10 |
| Dibromomethane #                        | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| Bromodichloromethane #                  | <2           | <2           | <2           |  |  |  |  |  |  | <2   | ug/l | TM15/PM10 |
| cis-1,3-Dichloropropene                 | <2           | <2           | <2           |  |  |  |  |  |  | <2   | ug/l | TM15/PM10 |
| Toluene #                               | <5           | <5           | <5           |  |  |  |  |  |  | <5   | ug/l | TM15/PM10 |
| trans-1,3-Dichloropropene               | <2           | <2           | <2           |  |  |  |  |  |  | <2   | ug/l | TM15/PM10 |
| 1,1,2-Trichloroethane #                 | <2           | <2           | <2           |  |  |  |  |  |  | <2   | ug/l | TM15/PM10 |
| Tetrachloroethene (PCE) #               | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| 1,3-Dichloropropane #                   | <2           | <2           | <2           |  |  |  |  |  |  | <2   | ug/l | TM15/PM10 |
| Dibromochloromethane #                  | <2           | <2           | <2           |  |  |  |  |  |  | <2   | ug/l | TM15/PM10 |
| 1,2-Dibromoethane #                     | <2           | <2           | <2           |  |  |  |  |  |  | <2   | ug/l | TM15/PM10 |
| Chlorobenzene #                         | <2           | <2           | <2           |  |  |  |  |  |  | <2   | ug/l | TM15/PM10 |
| 1,1,1,2-Tetrachloroethane #             | <2           | <2           | <2           |  |  |  |  |  |  | <2   | ug/l | TM15/PM10 |
| Ethylbenzene #                          | <0.5         | <0.5         | <0.5         |  |  |  |  |  |  | <0.5 | ug/l | TM15/PM10 |
| p/m-Xylene #                            | <1           | <1           | <1           |  |  |  |  |  |  | <1   | ug/l | TM15/PM10 |
| o-Xylene #                              | <0.5         | <0.5         | <0.5         |  |  |  |  |  |  | <0.5 | ug/l | TM15/PM10 |
| Styrene                                 | <2           | <2           | <2           |  |  |  |  |  |  | <2   | ug/l | TM15/PM10 |
| Bromoform #                             | <2           | <2           | <2           |  |  |  |  |  |  | <2   | ug/l | TM15/PM10 |
| Isopropylbenzene #                      | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| 1,1,2,2-Tetrachloroethane               | <4           | <4           | <4           |  |  |  |  |  |  | <4   | ug/l | TM15/PM10 |
| Bromobenzene #                          | <2           | <2           | <2           |  |  |  |  |  |  | <2   | ug/l | TM15/PM10 |
| 1,2,3-Trichloropropane #                | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| Propylbenzene #                         | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| 2-Chlorotoluene #                       | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| 1,3,5-Trimethylbenzene #                | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| 4-Chlorotoluene #                       | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| tert-Butylbenzene #                     | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| 1,2,4-Trimethylbenzene #                | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| sec-Butylbenzene #                      | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| 4-Isopropyltoluene #                    | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| 1,3-Dichlorobenzene #                   | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| 1,4-Dichlorobenzene #                   | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| n-Butylbenzene #                        | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| 1,2-Dichlorobenzene #                   | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| 1,2-Dibromo-3-chloropropane             | <2           | <2           | <2           |  |  |  |  |  |  | <2   | ug/l | TM15/PM10 |
| 1,2,4-Trichlorobenzene                  | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| Hexachlorobutadiene                     | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| Naphthalene                             | <2           | <2           | <2           |  |  |  |  |  |  | <2   | ug/l | TM15/PM10 |
| 1,2,3-Trichlorobenzene                  | <3           | <3           | <3           |  |  |  |  |  |  | <3   | ug/l | TM15/PM10 |
| Surrogate Recovery Toluene D8           | 91           | 95           | 98           |  |  |  |  |  |  | <0   | %    | TM15/PM10 |
| Surrogate Recovery 4-Bromofluorobenzene | 98           | 100          | 101          |  |  |  |  |  |  | <0   | %    | TM15/PM10 |

Please see attached notes for all abbreviations and acronyms

**Client Name:** Smith Grant LLP **Matrix : Liquid**

**Reference:** R2228

**Location:** Trows Farm

**Contact:** Ben Thomas

**Matrix : Liquid**

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

## NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 16/10975

### SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

### WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 (UKAS) accreditation applies to surface water and groundwater and one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

### DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

### SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

### DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

### NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.



## ABBREVIATIONS and ACRONYMS USED

|         |                                                                                                            |
|---------|------------------------------------------------------------------------------------------------------------|
| #       | ISO17025 (UKAS) accredited - UK.                                                                           |
| B       | Indicates analyte found in associated method blank.                                                        |
| DR      | Dilution required.                                                                                         |
| M       | MCERTS accredited.                                                                                         |
| NA      | Not applicable                                                                                             |
| NAD     | No Asbestos Detected.                                                                                      |
| ND      | None Detected (usually refers to VOC and/SVOC TICs).                                                       |
| NDP     | No Determination Possible                                                                                  |
| SS      | Calibrated against a single substance                                                                      |
| SV      | Surrogate recovery outside performance criteria. This may be due to a matrix effect.                       |
| W       | Results expressed on as received basis.                                                                    |
| +       | AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page. |
| ++      | Result outside calibration range, results should be considered as indicative only and are not accredited.  |
| *       | Analysis subcontracted to a Jones Environmental approved laboratory.                                       |
| AD      | Samples are dried at 35°C ±5°C                                                                             |
| CO      | Suspected carry over                                                                                       |
| LOD/LOR | Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS                                  |
| ME      | Matrix Effect                                                                                              |
| NFD     | No Fibres Detected                                                                                         |
| BS      | AQC Sample                                                                                                 |
| LB      | Blank Sample                                                                                               |
| N       | Client Sample                                                                                              |
| TB      | Trip Blank Sample                                                                                          |
| OC      | Outside Calibration Range                                                                                  |

JE Job No: 16/10975

| Test Method No. | Description                                                                                                                                               | Prep Method No. (if appropriate) | Description                                                                                                                  | ISO 17025 (UKAS) | MCERTS (UK soils only) | Analysis done on As Received (AR) or Dried (AD) | Reported on dry weight basis |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------|------------------------|-------------------------------------------------|------------------------------|
| TM5             | Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID. | PM30                             | Water samples are extracted with solvent using a magnetic stirrer to create a vortex.                                        | Yes              |                        |                                                 |                              |
| TM15            | Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.                                                  | PM10                             | Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.                              |                  |                        |                                                 |                              |
| TM15            | Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.                                                  | PM10                             | Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.                              | Yes              |                        |                                                 |                              |
| TM16            | Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.                                                      | PM30                             | Water samples are extracted with solvent using a magnetic stirrer to create a vortex.                                        |                  |                        |                                                 |                              |
| TM16            | Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.                                                      | PM30                             | Water samples are extracted with solvent using a magnetic stirrer to create a vortex.                                        | Yes              |                        |                                                 |                              |
| TM30            | Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7 and 6010B     | PM14                             | Analysis of waters and leachates for metals by ICP OES. Samples are filtered for dissolved metals and acidified if required. |                  |                        |                                                 |                              |
| TM30            | Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7 and 6010B     | PM14                             | Analysis of waters and leachates for metals by ICP OES. Samples are filtered for dissolved metals and acidified if required. | Yes              |                        |                                                 |                              |
| TM38            | Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1                   | PM0                              | No preparation is required.                                                                                                  | Yes              |                        |                                                 |                              |
| TM73            | Modified US EPA methods 150.1 and 9045D. Determination of pH by Metrohm automated probe analyser.                                                         | PM0                              | No preparation is required.                                                                                                  | Yes              |                        |                                                 |                              |
| NONE            | No Method Code                                                                                                                                            | NONE                             | No Method Code                                                                                                               |                  |                        |                                                 |                              |



Scientific Analysis Laboratories is a  
limited company registered in England and  
Wales (No 2514788) whose address is at  
Hadfield House, Hadfield Street, Manchester M16 9FE

# Scientific Analysis Laboratories Ltd

## Certificate of Analysis

Hadfield House  
Hadfield Street  
Cornbrook  
Manchester  
M16 9FE  
Tel : 0161 874 2400  
Fax : 0161 874 2468

**Report Number:** 586203-1

**Date of Report:** 28-Jul-2016

**Customer:** Smith Grant LLP  
Station House  
Station Road  
Ruabon  
Wrexham  
LL14 6DL

**Customer Contact:** Mr Ben Thomas

**Customer Job Reference:** R2228

**Customer Site Reference:** Trows FM

**Date Job Received at SAL:** 19-Jul-2016

**Date Analysis Started:** 20-Jul-2016

**Date Analysis Completed:** 28-Jul-2016

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with SAL SOPs

All results have been reviewed in accordance with Section 25 of the SAL Quality Manual

Report checked  
and authorised by :  
Muhammad Waqas  
Project Manager

Issued by :  
Muhammad Waqas  
Project Manager

|                                                                                                                                                                                  |               |                    |            |                    |                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------------|------------|--------------------|---------------------|
| <b>SAL Reference:</b> 586203<br><b>Project Site:</b> Trows FM<br><b>Customer Reference:</b> R2228<br><br><b>Bulk Product</b> Analysed as Bulk Product<br><b>Asbestos Bulk ID</b> |               |                    |            |                    |                     |
| <b>SAL Reference</b>                                                                                                                                                             |               |                    |            | <b>586203 001</b>  |                     |
| <b>Customer Sample Reference</b>                                                                                                                                                 |               |                    |            | <b>TIPS ACM</b>    |                     |
| <b>Date Sampled</b>                                                                                                                                                              |               |                    |            | <b>28-JUN-2016</b> |                     |
| <b>Determinand</b>                                                                                                                                                               | <b>Method</b> | <b>Test Sample</b> | <b>LOD</b> | <b>Units</b>       |                     |
| Asbestos                                                                                                                                                                         | T27           | AR                 |            |                    | Chrysotile Detected |
|                                                                                                                                                                                  |               |                    |            |                    | Asbestos Cement     |

## Index to symbols used in 586203-1

| Value | Description                 |
|-------|-----------------------------|
| AR    | As Received                 |
| S     | Analysis was subcontracted  |
| U     | Analysis is UKAS accredited |

## Notes

|                                             |
|---------------------------------------------|
| Asbestos was subcontracted to REC Asbestos. |
|---------------------------------------------|

## Method Index

| Value | Description |
|-------|-------------|
| T27   | PLM         |

## Accreditation Summary

| Determinand | Method | Test Sample | LOD | Units | Symbol | SAL References |
|-------------|--------|-------------|-----|-------|--------|----------------|
| Asbestos    | T27    | AR          |     |       | SU     | 001            |



## **APPENDIX F**

### **Geotechnical Laboratory Testing Results**



**TESTCONSULT LIMITED**  
Ruby House, 40A Hardwick Grange, Warrington WA1 4RF  
Tel (01925) 286880 Fax (01925) 286881



**LABORATORY TEST REPORT**  
**PARTICLE SIZE DISTRIBUTION - BS 1377: Part 2: 1990 - WET SIEVING**

|                    |                            |                       |            |
|--------------------|----------------------------|-----------------------|------------|
| <b>Project:</b>    | Trows Lane Farm , Rochdale | <b>Lab Ref No.:</b>   | SA25377    |
| <b>Client:</b>     | Smith Grant                | <b>Date Received:</b> | 30/06/2016 |
|                    |                            | <b>Date Tested:</b>   | 07/08/2016 |
|                    |                            | <b>Date Reported:</b> | 18/07/2016 |
|                    |                            | <b>Material:</b>      | Wet Sand   |
| <b>Originator:</b> | <b>Ben Thomas</b>          | <b>Specification:</b> |            |

**Client Sample Ref :**

TP 10 @ 1.3m

**Supplier:** Not Stated  
**Location:** Trows Lane Farm, Rochdale  
**Ticket No.:** Not Stated  
**Date Sampled :** Not Stated  
**Sample Type:** Bulk  
**Sampled By:** Client  
**Sampling Cert.:** Yes  
**Sample Preparation Method:** Oven dried  
**Specification:**

| <b>SIEVE ANALYSIS</b> |           |               |
|-----------------------|-----------|---------------|
| Sieve size            | % Passing | Specification |
| 125mm                 | 100       |               |
| 90mm                  | 100       |               |
| 75mm                  | 100       |               |
| 37.5mm                | 94        |               |
| 28mm                  | 91        |               |
| 20mm                  | 90        |               |
| 14mm                  | 89        |               |
| 10mm                  | 89        |               |
| 6.3mm                 | 88        |               |
| 5.0mm                 | 87        |               |
| 3.35mm                | 85        |               |
| 2.0mm                 | 85        |               |
| 1.18mm                | 84        |               |
| 600micron             | 83        |               |
| 425micron             | 80        |               |
| 300micron             | 70        |               |
| 150micron             | 29        |               |
| 63micron              | 10.7      |               |

Particle Size Distribution tested in accordance with BS1377: Part 2: 1990

**Approved Signature**  
**TESTCONSULT LIMITED**  
■ Mark Dawkins, Operations Manager

**TESTCONSULT LIMITED**

Ruby House, 40A Hardwick Grange, Warrington WA1 4RF  
Tel (01925) 286880 Fax (01925) 286881

**LABORATORY TEST REPORT****PARTICLE SIZE DISTRIBUTION - BS 1377: Part 2: 1990 - WET SIEVING**

|                    |                            |                       |            |
|--------------------|----------------------------|-----------------------|------------|
| <b>Project:</b>    | Trows Lane Farm , Rochdale | <b>Lab Ref No.:</b>   | SA25377    |
| <b>Client:</b>     | Smith Grant                | <b>Date Received:</b> | 30/06/2016 |
|                    |                            | <b>Date Tested:</b>   | 07/08/2016 |
|                    |                            | <b>Date Reported:</b> | 18/07/2016 |
|                    |                            | <b>Material:</b>      | Sand       |
| <b>Originator:</b> | <b>Ben Thomas</b>          | <b>Specification:</b> |            |

**Client Sample Ref :**

TP 19 @ 1.4m

**Supplier:** Not Stated

**Location:** Trows Lane Farm, Rochdale

**Ticket No.:** Not Stated

**Date Sampled :** Not Stated

**Sample Type:** Bulk

**Sampled By:** Client

**Sampling Cert.:** Yes

**Sample Preparation Method:** Oven dried

**Specification:**

| SIEVE ANALYSIS |           |               |
|----------------|-----------|---------------|
| Sieve size     | % Passing | Specification |
| 125mm          | 100       |               |
| 90mm           | 100       |               |
| 75mm           | 92        |               |
| 37.5mm         | 88        |               |
| 28mm           | 87        |               |
| 20mm           | 82        |               |
| 14mm           | 80        |               |
| 10mm           | 78        |               |
| 6.3mm          | 74        |               |
| 5.0mm          | 72        |               |
| 3.35mm         | 70        |               |
| 2.0mm          | 68        |               |
| 1.18mm         | 67        |               |
| 600micron      | 65        |               |
| 425micron      | 62        |               |
| 300micron      | 49        |               |
| 150micron      | 15        |               |
| 63micron       | 4.8       |               |

Particle Size Distribution tested in accordance with BS1377: Part 2: 1990

**Approved Signature****TESTCONSULT LIMITED**

■ Mark Dawkins, Operations Manager

**TESTCONSULT LIMITED**

Ruby House, 40A Hardwick Grange, Warrington WA1 4RF  
Tel (01925) 286880 Fax (01925) 286881

**LABORATORY TEST REPORT****PARTICLE SIZE DISTRIBUTION - BS 1377: Part 2: 1990 - WET SIEVING**

|                    |                            |                       |            |
|--------------------|----------------------------|-----------------------|------------|
| <b>Project:</b>    | Trows Lane Farm , Rochdale | <b>Lab Ref No.:</b>   | SA25377    |
| <b>Client:</b>     | Smith Grant                | <b>Date Received:</b> | 30/06/2016 |
|                    |                            | <b>Date Tested:</b>   | 07/08/2016 |
|                    |                            | <b>Date Reported:</b> | 18/07/2016 |
|                    |                            | <b>Material:</b>      | Sand       |
| <b>Originator:</b> | <b>Ben Thomas</b>          | <b>Specification:</b> |            |

**Client Sample Ref :**

TP 04 @ 0.8m

**Supplier:** Not Stated

**Location:** Trows Lane Farm, Rochdale

**Ticket No.:** Not Stated

**Date Sampled :** Not Stated

**Sample Type:** Bulk

**Sampled By:** Client

**Sampling Cert.:** Yes

**Sample Preparation Method:** Oven dried

**Specification:**

| SIEVE ANALYSIS |           |               |
|----------------|-----------|---------------|
| Sieve size     | % Passing | Specification |
| 125mm          | 100       |               |
| 90mm           | 100       |               |
| 75mm           | 100       |               |
| 37.5mm         | 100       |               |
| 28mm           | 100       |               |
| 20mm           | 100       |               |
| 14mm           | 100       |               |
| 10mm           | 100       |               |
| 6.3mm          | 100       |               |
| 5.0mm          | 100       |               |
| 3.35mm         | 99        |               |
| 2.0mm          | 99        |               |
| 1.18mm         | 99        |               |
| 600micron      | 99        |               |
| 425micron      | 98        |               |
| 300micron      | 96        |               |
| 150micron      | 84        |               |
| 63micron       | 28.4      |               |

Particle Size Distribution tested in accordance with BS1377: Part 2: 1990

**Approved Signature****TESTCONSULT LIMITED**

■ Mark Dawkins, Operations Manager



**TESTCONSULT LIMITED**

Ruby House, 40A Hardwick Grange, Warrington WA1 4RF  
Tel (01925) 286880 Fax (01925) 286881

**LABORATORY TEST REPORT****PARTICLE SIZE DISTRIBUTION - BS 1377: Part 2: 1990 - WET SIEVING**

|                    |                            |                       |            |
|--------------------|----------------------------|-----------------------|------------|
| <b>Project:</b>    | Trows Lane Farm , Rochdale | <b>Lab Ref No.:</b>   | SA25377    |
| <b>Client:</b>     | Smith Grant                | <b>Date Received:</b> | 30/06/2016 |
|                    |                            | <b>Date Tested:</b>   | 07/08/2016 |
|                    |                            | <b>Date Reported:</b> | 18/07/2016 |
|                    |                            | <b>Material:</b>      | Sand       |
| <b>Originator:</b> | <b>Ben Thomas</b>          | <b>Specification:</b> |            |

**Client Sample Ref :**

TP 18 @ 1.0m

**Supplier:** Not Stated

**Location:** Trows Lane Farm, Rochdale

**Ticket No.:** Not Stated

**Date Sampled :** Not Stated

**Sample Type:** Bulk

**Sampled By:** Client

**Sampling Cert.:** Yes

**Sample Preparation Method:** Oven dried

**Specification:**

| SIEVE ANALYSIS |           |               |
|----------------|-----------|---------------|
| Sieve size     | % Passing | Specification |
| 125mm          | 100       |               |
| 90mm           | 100       |               |
| 75mm           | 100       |               |
| 37.5mm         | 93        |               |
| 28mm           | 89        |               |
| 20mm           | 86        |               |
| 14mm           | 84        |               |
| 10mm           | 83        |               |
| 6.3mm          | 82        |               |
| 5.0mm          | 81        |               |
| 3.35mm         | 80        |               |
| 2.0mm          | 79        |               |
| 1.18mm         | 78        |               |
| 600micron      | 76        |               |
| 425micron      | 75        |               |
| 300micron      | 71        |               |
| 150micron      | 58        |               |
| 63micron       | 39.0      |               |

Particle Size Distribution tested in accordance with BS1377: Part 2: 1990

**Approved Signature****TESTCONSULT LIMITED**

■ Mark Dawkins, Operations Manager



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Tel (01925) 286880 Fax (01925) 286881



**LABORATORY TEST REPORT**  
**PARTICLE SIZE DISTRIBUTION - BS 1377: Part 2: 1990 - WET SIEVING**

|                    |                            |                       |            |
|--------------------|----------------------------|-----------------------|------------|
| <b>Project:</b>    | Trows Lane Farm , Rochdale | <b>Lab Ref No.:</b>   | SA25377    |
| <b>Client:</b>     | Smith Grant                | <b>Date Received:</b> | 30/06/2016 |
|                    |                            | <b>Date Tested:</b>   | 07/08/2016 |
|                    |                            | <b>Date Reported:</b> | 18/07/2016 |
|                    |                            | <b>Material:</b>      | Sand       |
| <b>Originator:</b> | <b>Ben Thomas</b>          | <b>Specification:</b> |            |

**Client Sample Ref :**

TP 14 @ 1.5m

**Supplier:** Not Stated  
**Location:** Trows Lane Farm, Rochdale  
**Ticket No.:** Not Stated  
**Date Sampled :** Not Stated  
**Sample Type:** Bulk  
**Sampled By:** Client  
**Sampling Cert.:** Yes  
**Sample Preparation Method:** Oven dried  
**Specification:**

| <b>SIEVE ANALYSIS</b> |           |               |
|-----------------------|-----------|---------------|
| Sieve size            | % Passing | Specification |
| 125mm                 | 100       |               |
| 90mm                  | 100       |               |
| 75mm                  | 100       |               |
| 37.5mm                | 100       |               |
| 28mm                  | 100       |               |
| 20mm                  | 100       |               |
| 14mm                  | 99        |               |
| 10mm                  | 99        |               |
| 6.3mm                 | 99        |               |
| 5.0mm                 | 99        |               |
| 3.35mm                | 99        |               |
| 2.0mm                 | 99        |               |
| 1.18mm                | 99        |               |
| 600micron             | 98        |               |
| 425micron             | 96        |               |
| 300micron             | 88        |               |
| 150micron             | 48        |               |
| 63micron              | 18.8      |               |

Particle Size Distribution tested in accordance with BS1377: Part 2: 1990

**Approved Signature**  
**TESTCONSULT LIMITED**  
■ Mark Dawkins, Operations Manager

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**LABORATORY TEST REPORT****PARTICLE SIZE DISTRIBUTION - BS 1377: Part 2: 1990 - WET SIEVING**

|                    |                            |                       |            |
|--------------------|----------------------------|-----------------------|------------|
| <b>Project:</b>    | Trows Lane Farm , Rochdale | <b>Lab Ref No.:</b>   | SA25377    |
| <b>Client:</b>     | Smith Grant                | <b>Date Received:</b> | 30/06/2016 |
|                    |                            | <b>Date Tested:</b>   | 07/08/2016 |
|                    |                            | <b>Date Reported:</b> | 18/07/2016 |
|                    |                            | <b>Material:</b>      | Sand       |
| <b>Originator:</b> | <b>Ben Thomas</b>          | <b>Specification:</b> |            |

**Client Sample Ref :**

TP 09 @ 0.9m

**Supplier:** Not Stated

**Location:** Trows Lane Farm, Rochdale

**Ticket No.:** Not Stated

**Date Sampled :** Not Stated

**Sample Type:** Bulk

**Sampled By:** Client

**Sampling Cert.:** Yes

**Sample Preparation Method:** Oven dried

**Specification:**

| SIEVE ANALYSIS |           |               |
|----------------|-----------|---------------|
| Sieve size     | % Passing | Specification |
| 125mm          | 100       |               |
| 90mm           | 100       |               |
| 75mm           | 100       |               |
| 37.5mm         | 92        |               |
| 28mm           | 91        |               |
| 20mm           | 90        |               |
| 14mm           | 87        |               |
| 10mm           | 86        |               |
| 6.3mm          | 83        |               |
| 5.0mm          | 82        |               |
| 3.35mm         | 81        |               |
| 2.0mm          | 80        |               |
| 1.18mm         | 79        |               |
| 600micron      | 78        |               |
| 425micron      | 75        |               |
| 300micron      | 66        |               |
| 150micron      | 28        |               |
| 63micron       | 10.7      |               |

Particle Size Distribution tested in accordance with BS1377: Part 2: 1990

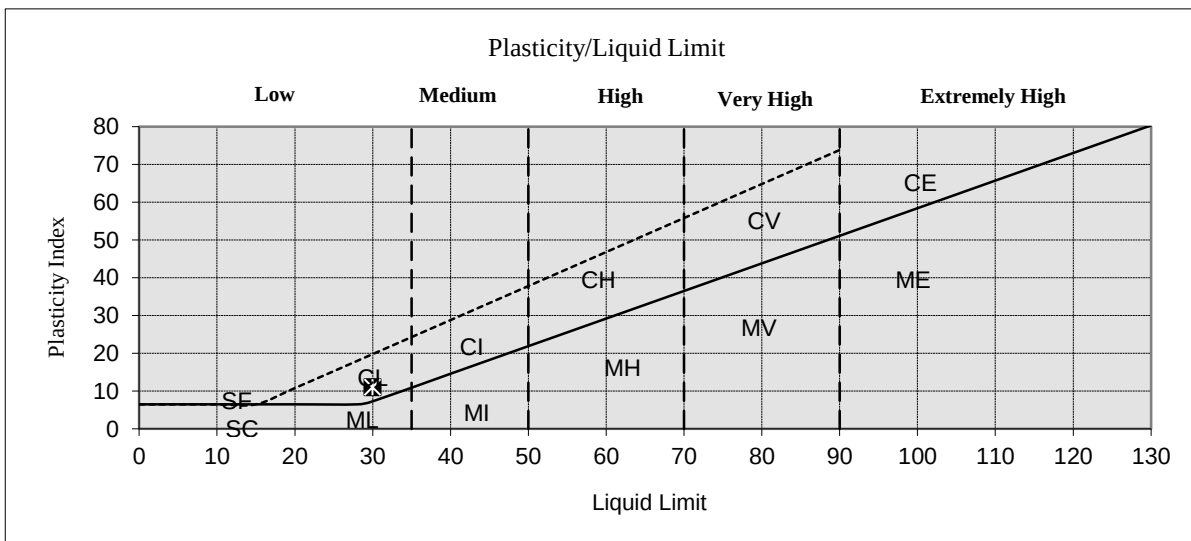
**Approved Signature****TESTCONSULT LIMITED**

■ Mark Dawkins, Operations Manager

**LABORATORY TEST REPORT**  
**LIQUID & PLASTIC LIMIT TESTS BS 1377: Part 2: 1990 Cl 4.4,5.3**

|                    |                           |                       |              |
|--------------------|---------------------------|-----------------------|--------------|
| <b>Site Ref.:</b>  | Trows Lane Farm, Rochdale | <b>Job No.:</b>       | 23179        |
| <b>Client:</b>     | Smith Grant               | <b>Lab Ref No.:</b>   | SA25377/01   |
|                    |                           | <b>Sample Ref.:</b>   | TP 16 @ 1.0m |
|                    |                           | <b>Date Received:</b> | 30/06/2016   |
|                    |                           | <b>Date Tested:</b>   | 07/08/2016   |
| <b>Originator:</b> | <b>Ben Thomas</b>         | <b>Date Reported:</b> | 08/08/2016   |

|                                |             |
|--------------------------------|-------------|
| Sampling Certificate           | Yes         |
| Sampled By                     | Client      |
| Sample Type                    | Bulk        |
| Sample Preparation Method      | As Received |
| MATERIAL                       | Brown Clay  |
| Retained 425 micron (%)        | 0           |
| Natural Moisture Content (%)   | 23          |
| Liquid Limit (single point)(%) | 30          |
| Plastic Limit (%)              | 19          |
| Plasticity Index               | 11          |



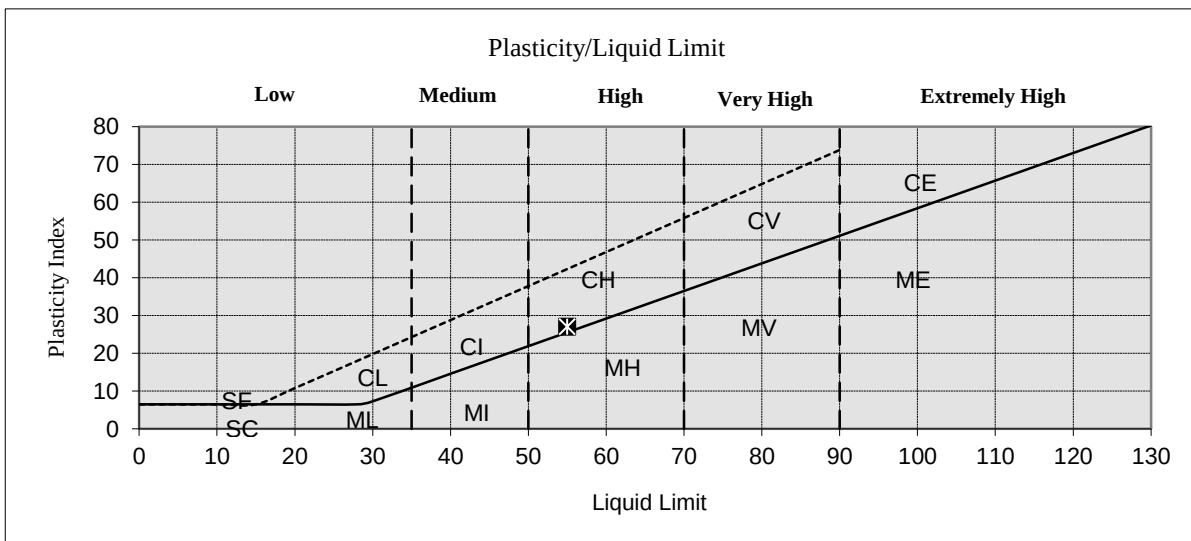

**Approved Signature**  
**TESTCONSULT LIMITED**  
■ Mark Dawkins, Operations Manger



**LABORATORY TEST REPORT**  
**LIQUID & PLASTIC LIMIT TESTS BS 1377: Part 2: 1990 Cl 4.4,5.3**

|                    |                           |                       |              |
|--------------------|---------------------------|-----------------------|--------------|
| <b>Site Ref.:</b>  | Trows Lane Farm, Rochdale | <b>Job No.:</b>       | 23179        |
| <b>Client:</b>     | Smith Grant               | <b>Lab Ref No.:</b>   | SA25377/01   |
|                    |                           | <b>Sample Ref.:</b>   | TP 18 @ 2.5m |
|                    |                           | <b>Date Received:</b> | 30/06/2016   |
|                    |                           | <b>Date Tested:</b>   | 07/08/2016   |
| <b>Originator:</b> | <b>Ben Thomas</b>         | <b>Date Reported:</b> | 08/08/2016   |

|                                |             |
|--------------------------------|-------------|
| Sampling Certificate           | Yes         |
| Sampled By                     | Client      |
| Sample Type                    | Bulk        |
| Sample Preparation Method      | As Received |
| MATERIAL                       | Brown Clay  |
| Retained 425 micron (%)        | 0           |
| Natural Moisture Content (%)   | 35          |
| Liquid Limit (single point)(%) | 55          |
| Plastic Limit (%)              | 28          |
| Plasticity Index               | 27          |

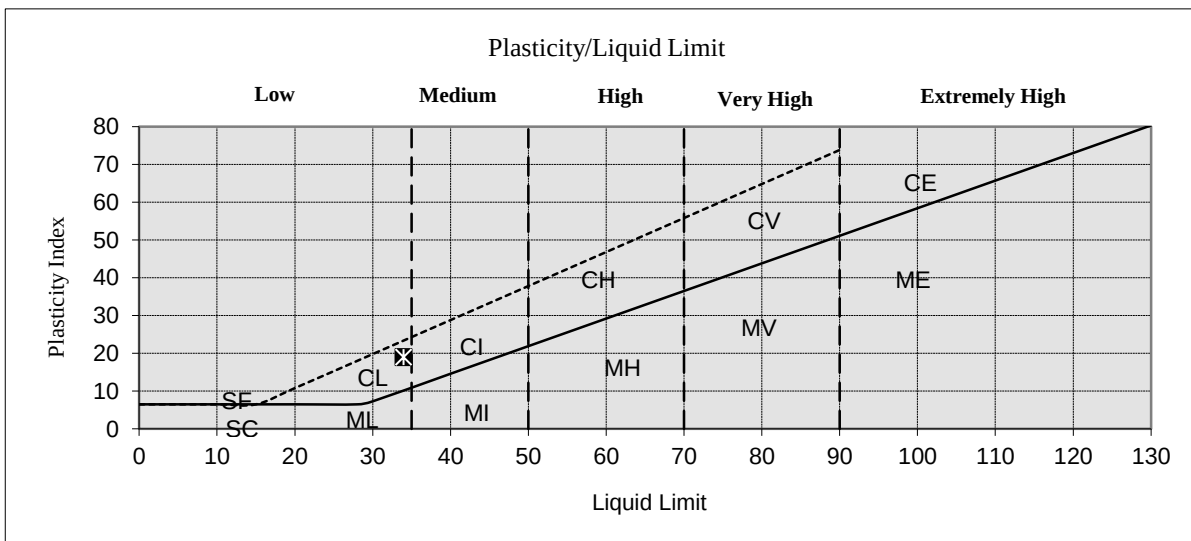



**Approved Signature**  
**TESTCONSULT LIMITED**  
■ Mark Dawkins, Operations Manager

**LABORATORY TEST REPORT**  
**LIQUID & PLASTIC LIMIT TESTS BS 1377: Part 2: 1990 Cl 4.4,5.3**

|                    |                           |                       |              |
|--------------------|---------------------------|-----------------------|--------------|
| <b>Site Ref.:</b>  | Trows Lane Farm, Rochdale | <b>Job No.:</b>       | 23179        |
| <b>Client:</b>     | Smith Grant               | <b>Lab Ref No.:</b>   | SA25377/01   |
|                    |                           | <b>Sample Ref.:</b>   | TP 06 @ 1.1m |
|                    |                           | <b>Date Received:</b> | 30/06/2016   |
|                    |                           | <b>Date Tested:</b>   | 07/08/2016   |
| <b>Originator:</b> | <b>Ben Thomas</b>         | <b>Date Reported:</b> | 08/08/2016   |

|                                |             |
|--------------------------------|-------------|
| Sampling Certificate           | Yes         |
| Sampled By                     | Client      |
| Sample Type                    | Bulk        |
| Sample Preparation Method      | As Received |
| MATERIAL                       | Clay        |
| Retained 425 micron (%)        | 0           |
| Natural Moisture Content (%)   | 16          |
| Liquid Limit (single point)(%) | 34          |
| Plastic Limit (%)              | 15          |
| Plasticity Index               | 19          |




**Approved Signature**  
**TESTCONSULT LIMITED**  
■ Mark Dawkins, Operations Manager