REPORT C6944A
JUNE 2016

GEOENVIRONMENTAL APPRASIAL

of land off
ASHBROW ROAD, HUDDERSFIELD

prepared for
KIRKLEES MDC, WATES LIVING SPACE, GALLIFORD TRY,

KIER LIVING & KEEPMOAT HOMES

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SITE:	ASHBROW ROAD, HUDDERSFIELD		
PREPARED FOR:	KIRKLEES MDC, WATES LIVING SPACE, GALLIFORD TRY, KIER LIVING & KEEPMOAT HOMES		
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EXECUTIVE SUMMARY

Introduction	Sirius Geotechnical and Environmental Ltd was commissioned by Kirklees MDC and a panel of bidders comprising Wates Living Space, Galliford Try, Kier living and Keepmoat Homes to undertake a geoenvironmental appraisal of land off Ashbrow Road, Huddersfield (the "site"). It is understood that consideration is being given to the development of the site for a low rise residential with gardens end-use.
Site Details	The site comprises a triangular shaped plot of land covering a total area of 4.5 hectares. The site is unoccupied and covered with rough grassland with areas of dense undergrowth and trees of varying age. An area along the southern boundary comprises a number of mature trees covered by a Tree Preservation Order (TPO). The northern site area is relatively flat with slopes running down to the south, east and west, becoming steep along the site boundary. There is evidence of historic quarrying along the western boundary where a section of highwall remains.
Site History	Review of historical OS mapping indicates that the majority of the site has remained undeveloped throughout its history with the exception of the two areas of sandstone quarrying along the southern and western boundaries and a small number of buildings both within the quarry areas and along the southern boundary which are no longer present.
Fieldwork	Fieldworks undertaken by Sirius were completed between 28th April and 6th May 2016 and comprised the drilling of window sample boreholes, and the excavation of machine dug trial pits. Gas and groundwater monitoring wells were installed within selected boreholes and soakaway testing was undertaken within selected trial pits.
Laboratory Testing	Soil, groundwater and surface water samples were submitted for analysis for a range of metals and other inorganic and organic components. Geotechnical testing was scheduled on selected soil samples. All testing was undertaken at accredited laboratories.
Ground Condition	The undeveloped areas of the site were typically underlain by a uniform thickness of topsoil, locally reworked to a depth of 0.3m bgl, which in turn is underlain by residual soils comprising natural completely weathered / residual bedrock, typically dense or very dense silty, sandy, gravel with cobbles and boulders proven to a maximum depth of 3.00m bgl. Locally, cohesive natural soils comprising firm to very stiff, medium to very high strength, slightly sandy, gravelly, silty clay were encountered to depths of between 0.40 and greater than 1.60m bgl. Ground conditions within the former quarries comprised reworked natural soils typically soft, low strength, sandy, gravelly clay overlying loose to medium dense, silty, sandy, sandstone gravel with sandstone cobbles and boulders. The depth of fill was recorded to 2.50m, potentially extendingto greater than 5.00m bgl. Bedrock beneath the made ground and residual soils varied from extremely weak to medium strong sandstone.
Mining and Quarrying	Sandstone has been historically quarried within the western and southern parts of the site. The risk of surface instability as a result of underground coal and Elland Flag mineworkings is considered to be negligible and low, respectively. However, the possibility of encountering unrecorded mineshafts, quarries and/or pits cannot be fully discounted. It is therefore recommended that all excavations be examined for evidence of such infilled features. If evidence of a mine entry, quarry, pit or ground disturbance is suspected, advice regarding treatment / foundation precautions should be sought from a suitably qualified engineer.
Foundations and Floor Slabs	Within the undeveloped site area, it is considered that the most suitable foundation solution would comprise strips/trench fill taken down through the topsoil into the underlying natural ground of adequate bearing capacity. Given the potentially significant depths of quarry backfill materials encountered within the quarry areas it is considered that piles would be the most suitable foundation solution within these areas. Plots over the former highwall may experience unacceptable differential settlements, and will therefore require foundations to be advanced to natural ground. Depending on where the properties lie with respect to the highwall line, this could be deepened trench fill foundations, or may require piled

	foundations dependant on the depths of made ground present. It is considered that ground bearing floor slabs could be utilised within the undeveloped areas of the site. Across the quarry backfill areas and locally where low strength/loose natural soils are encountered and/or soil swelling may occur suspended floor slabs should be utilised.
Sulphate Class	A Design Sulphate Class of DS-1 and an ACEC Class of AC-1 should be used for buried concrete structures.
Contamination	Marginally elevated concentrations of lead as well as asbestos fibres were recorded locally within single samples of the shallow made ground/reworked topsoil. Where these materials directly underlie the development a subsoil/topsoil "cap" will be required in areas of proposed landscaping. Alternatively,the materials could be placed beneath areas of hardstanding or due to the localised nature of the contamination, impacted soils may be removed to a suitably licensed landfill facility. In view of the asbestos identified locally, it is recommended that as part of the enabling works further samples be tested for the presence of asbestos to delineate this area and appropriate remedial measures taken. Should this additional testing confirm the presence of asbestos, the capping layer should include a dense granular 'no dig' layer or geotextile marker layer along its base where asbestos impacted soils are present. The design of the capping layer is subject to regulatory consultation. It is not considered that remedial works will be required in order to protect controlled waters.
Gas Protection	A preliminary gas risk assessment categorises the site as Green/Characteristic Situation 1. Radon protective measures are not required for the site. This assessment should be regarded as interim only, prior to completion of the monitoring programme.
Other	It is recommended that the absence of invasive plant species is confirmed by a qualified consultant ecologist and their advice taken on appropriate treatment. The treatment of any invasive species should take place in advance of the proposed construction works.

THE EXECUTIVE SUMMARY IS AN OVERVIEW OF THE KEY FINDINGS AND CONCLUSIONS OF THE REPORT. THERE MAY BE OTHER INFORMATION CONTAINED IN THE BODY OF THE REPORT WHICH PUTS INTO CONTEXT THE FINDINGS OF THE EXECUTIVE SUMMARY. NO RELIANCE SHOULD BE PLACED ON THE EXECUTIVE SUMMARY IN ISOLATION, PARTICULARLY WHEN DERIVING DESIGN DETAIL/ABNORMAL COSTS.

1. INTRODUCTION

Sirius Geotechnical and Environmental Ltd (Sirius) were commissioned by Kirklees MDC and a panel of bidders comprising Wates Living Space, Galiford Try, Kier Living and Keepmoat Homes to undertake a geoenvironmental appraisal of land located off Ashbrow Road, Huddersfield (the "site").

It is understood that consideration is being given to the development of the site with low rise (two and three storey) residential end use. The proposed development is understood to comprise houses with private gardens, associated areas of public open space (POS) and highways. No development layout plan has been provided or referenced and no loadings or development levels were known at the time of writing this report.

The objectives of this appraisal were to:

- Establish the historical development of the site and surrounding area from a review of available Ordnance Survey (OS) mapping.
- Establish the environmental setting of the site.
- Investigate near surface soil and groundwater conditions.
- Determine the potential risks posed by any ground contamination and provide recommendations on remedial measures to manage such risks.
- Determine the potential risk to the development from hazardous ground gas sources, including radon.
- Evaluate whether past mining or other extractive industries could have an influence on the surface stability of the site.
- To determine infiltration characteristics of shallow soils to enable others to design soakaways, if viable; and,
- Provide recommendations for foundation, floor slab and highway/pavement design for the proposed development.

The desk study element of this investigation includes an assessment of information provided by Landmark Information Group (LIG) Envirocheck report, the British Geological Survey (BGS), the Local Authority (LA), the Coal Authority (CA), available online information provided by the Environment Agency (EA) and a review of information from a previous desk study, undertaken by Rogers Geotechnical Services Limited (RGS).

Fieldworks undertaken by Sirius were completed from 28th April to6th May 2016 and comprised the drilling of window sample boreholes and the excavation of machine dug trial pits. Gas and groundwater monitoring wells were installed within selected boreholes. Soakaway testing was undertaken in selected trial pits.

This report presents the factual information available during this appraisal, interpretation of the data obtained and recommendations relevant to the defined objectives.

Where the report refers to the potential presence of invasive plants (such as Japanese Knotweed) or asbestos-containing materials (ACMs), such observations are for information only and should be verified by a suitably qualified expert.

The comments and opinions presented in this report are based on the findings of the desk study, ground conditions encountered during intrusive investigation works performed by Sirius and the results of tests carried out within one or more laboratories. There may be other conditions prevailing on the site, which have not been revealed by this investigation and which have not been taken into account by this report. Responsibility cannot be accepted for any conditions not revealed by this investigation. Any diagram or opinion on the possible configuration of strata, contamination or other spatially variable features between or beyond investigation positions is conjectural and given for guidance only. Confirmation of ground conditions between exploratory holes should be undertaken if deemed necessary. Evaluation of ground gas and groundwater is based on observations made at the time of the investigation and subsequent monitoring visits. It should be noted that ground gas, groundwater levels and quality may vary due to seasonal variations and other effects.

This report has been prepared for the sole use of Kirklees MDC, Wates Living Space, Galiford Try, Kier Living and Keepmoat Homes. No other third party may rely upon or reproduce the contents of this report without the written approval of Sirius. If any unauthorised third party comes into possession of this report, they rely on it entirely at their own risk and the authors do not owe them any Duty of Care or Skill.

2. SITE DETAILS AND DESCRIPTION

Table 2.1 Current Site Overview

Location	The site is located to the north of Ashbrow Road, in the area of Sheepridge, approximately 2.5km north of Huddersfield town centre. A site location plan is included as Drawing No. C6944/01 within Appendix A.
National Grid Reference	414870E, 419250N
Topography and Features	The site comprises a roughly triangular shaped area of land covered, in the main, by rough grassland with a hedgerow running approximately north – south through the centre of the site and a number of semi-mature trees scattered across the area. There is also an area of mature trees across the eastern part of the southern boundary which are covered by a Tree Protection Order (TPO) as indicated on Drawing No. C6944A/02 within Appendix A. The northern/central area of the site is relatively flat, sloping away and steepening downwards towards the south, east and west. The central/southern area slopes at approximately 1 in 8 with a short steep bank along the southern boundary as steep as 1 in 2. The western portion of the site slopes relatively steeply at approximately 1 in 4 down to the west. Historic quarrying is evident on the southern portion of the western flank of the site, where a small section of quarry highwall is exposed.
Approximate Site Area	4.5 Hectares
Site Boundaries	The site boundaries are generally delineated by a combination of chain-link fencing, hedges, dense scrub vegetation and semi-mature and mature trees. Generally, the site is bounded by Ashbrow Road and residential properties to the south and east, residential properties and an industrial unit to the west, an area of woodland to the northwest and Ashbrow Infant and Nursery School to the northeast.

Current Land Use	The site is currently undeveloped and is used primarily for grazing horses and dog walking.
Invasive Plant Species	None noted during works, however an ecological survey should be carried out by a suitably qualified specialist to confirm the presence/absence of any invasive plant species on, or near to, the site.

3. ENVIRONMENTAL SETTING

3.1 Introduction

An LIG Envirocheck Report and CA Mining Report for the site were reviewed, in addition to an assessment of published environmental, geological and historical data relating to the site. A summary of salient information is provided below. The Envirocheck and CA Reports were commissioned as part of the RGS Desk Study, prepared on behalf of Kirklees MDC, which is included in its entirety in Appendix E.

In addition, search enquiries were made with the Environmental Health, Building Control and Minerals Planning and Land Ownership departments of Kirklees Council. Copies of correspondence received are included within Appendix D.

3.2 Site History

Table 3.1 presents a summary of the historical land uses of the site from 1854 to the present. It is not the intention of this report to describe in detail all of the changes that have occurred on or adjacent to the site, only those pertinent to the proposed development.

Table 3.1 Site History

Map Dates	On-Site Features	Off-Site Features (only features within 500m that may affect the site are listed)
1854-1894	The earliest available OS mapping shows the site to comprise undeveloped, agricultural land incorporating field boundaries located within a semi-rural setting, identified as Sheepridge Common. Two sandstone quarries are identified, one on the southern boundary and one on the southern part of the western boundary. There are also a small number of residential properties along the southern site boundary, along Ash Brow Road, some of which are shown	There are a number of farms within the immediate surrounding area and Ash Brow Mill (Spinning and Weaving) is indicated immediately to the west of the site. To the west of the site boundary, around the mill and beyond, a number of small sandstone quarries and sand pits are indicated.

Map Dates	On-Site Features	Off-Site Features (only features within 500m that may affect the site are listed)
	to lie within the site boundary.	
1906-1938	The quarry along the southern boundary is no longer indicated, suggesting it may have been backfilled. The one along the western boundary is marked by a cliff/outcrop but is not indicated to be active. A small rectangular pond feature is shown within the eastern part of the site which, by 1933, is no longer present.	Ash Brow Mills is indicated to be disused on the 1906 plan but is shown to be in use again by 1918. A tramway is indicated along Ash Brow Road, to the south of the site. Plans indicate residential development of the general surrounding area, particularly to the south and west.
1959-Present	The 1959 plan indicates that the buildings inside the site's southern boundary are no longer present. To the east of this, along the southern boundary a new section of road, named as Bradley Boulevard, is present with a slope indicated along the site boundary. The tramway is no longer present. Within the former quarry area in the west of the site a number of small unidentified buildings are shown.	Plans indicate continuing residential development of all the surrounding areas. By 1970 a number of school buildings are indicated to the northeast of the site, identified as Ashbrow County Primary School.

3.3 Published Geological Information

A summary of available published geological information is provided in Table 3.2 below.

Table 3.2 Geological Summary

Sources of Information	BGS 1:50,000 scale geological map (Sheet 77 Huddersfield). BGS 1:10,000 scale geological maps (ref: SE11NW). BGS Borehole Records (available online). BGS Report Vol 16 No 4 "Mining in the Elland Flags: a forgotten Yorkshire industry".
Made Ground	No made ground is indicated on the published plans, although it is anticipated in the former quarry areas.
Superficial Deposits	No superficial deposits are indicated to overlie the solid strata outside of the quarried areas.
Solid Geology	The solid geology underlying the site is recorded to comprise the Elland Flags Formation of Upper Carboniferous age, typically recorded as fine to medium grained flaggy to thickly bedded micaceous sandstone with interbedded grey mudstone, siltstone and sandstone of the Pennine Lower Coal Measures Formation. The south western part of the site and the bulk of the central and northern area are underlain by the Elland Flags with a central band trending north west to south east recorded to be underlain by undifferentiated strata of the Lower Coal Measures (LCM), comprising interbedded mudstone, sandstone and siltstone. Strata are indicated to dip at approximately 5˚ to the north - northeast. No faulting is indicated to cross the site area on the BGS plans.
BGS Borehole Records	Review of available borehole records, held by the BGS, drilled within land to the north and west of the site identified natural granular and cohesive deposits representing weathered sandstones and Coal Measures strata to depths of between 1.0m and 3.0m bgl, underlain by Elland Flags sandstone and LCM strata, respectively.

Mining and Quarrying	**Coal Mining:** The CA mining report for the site states the following: • "*The property is not within the likely zone of influence from underground coal workings"*. • "*There are no known coal mine entries within, or within 20 metres of, the site boundary*". • *"The property is not within the boundary of an opencast site from which coal has been removed by opencast methods".* **Quarries/Elland Flag Workings:** The earliest available historical OS maps, dated from 1854, indicate two small sandstone quarries, partially within the site, along the southern and western boundaries as well as a number of sandstone quarries in the area to the west of the site. The onsite quarries are a BGS recorded mineral site known as Cuckolds Clough Quarries, recorded for the opencast extraction of Elland Flags. By 1894 the onsite sandstone quarries appear to be disused and later mapping indicates them to be partially or completely infilled. Further BGS recorded mineral sites relating to opencast Elland Flag extraction are present within the area, including Ash Brow Quarry, 179m to the west and Woodside Mine, 296m to the northwest and Netheroyd Hill Quarry 332m to the northwest. There is a record of 'Man-Made Mining Cavities' in the area of Woodside Mine relating to Elland Flag mining. However, no further details are provided from the source. Further to this the site is considered to be in an area of 'likely risk' in the record of non-coal mining areas. BGS Report Vol 16 No 4 "Mining in the Elland Flags: a forgotten Yorkshire industry" lists records of underground mines in the Elland Flags. There is no reference to underground workings in the proximity of the site or relating to Woodside Mine. However, it is well documented that the Elland flags were extracted from underground mines in the region, often in the form of headings driven into the flagstone beds from opencast/quarried extraction

	sites. For this reason, the potential for unrecorded underground workings cannot be entirely discounted. Enquiries have been made to Kirklees Council Building Control, Minerals Planning and Land Ownership departments regarding any records held concerning Elland Flag Mineworkings. They have commented that they have no knowledge of any issues within the vicinity of the site relating to Elland Flag workings and that no records are held of planning permission issued for the extraction of minerals. However, they have referenced the historical Ordnance Survey plans, which indicate the onsite quarries discussed above.

3.4 Hydrology and Hydrogeology

A summary of available information pertaining to hydrology and hydrogeology is present in Tables 3.3 to 3.5 below.

Table 3.3 Surface Water Features

	Presence/location	**Comments**
Environment Agency (EA) GQA Classified Watercourses (within 500m)	None within 500m of the site.	The site lies within the Aire and Calder Navigation Catchment Area.
Unclassified Watercourses (within 500m)	No watercourses are recorded on site. The closest watercourse is an unnamed stream, classified as a Tertiary River, located 30m to the northwest of the site boundary. The closest Secondary River is Blackhouse Dyke, 276m to the south of the site.	The unnamed stream flows southwards and is culverted, becoming a tributary of Blackhouse Dyke, which in turn is a tributary of the River Calder.

	Presence/location	Comments
Licensed Surface Water Abstractions (within 1km)	There are no active licensed surface water abstractions within 1km of the site.	
Surface Water Features (Canals, Ponds, Lakes, etc.) (within 500m)	There is a small pond associated with former quarrying activities located in the wooded area approximately 27m to the northwest of the site. There is also a small mill pond associated with the former Ash Brow Mill to the west of the site.	The pond to the northwest is likely to be seasonal and relates to an issue and discharge of the unnamed stream (Tertiary River).
Flood Risk Status	The site is not located within an indicative Zone 2 or 3 fluvial floodplain.	

Table 3.4 Groundwater Occurrence and Abstraction

	Presence/location	Comments
Licensed Abstractions (within 1km)	There are no active licensed groundwater abstractions within 1km of the site.	
Potable Abstraction License (within 1km)	None recorded within 1km of the site.	
Source Protection Zones (within 500m)	The site is not located within a source protection zone.	

Table 3.5 Groundwater Vulnerability Status

	Environment Agency Classification
Groundwater Classification	The solid strata of the Elland Flags Formation and LCM underlying the site are classified as a Secondary A Aquifer, defined as *'permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers'.*

3.5 Landfilling and Waste Management

Table 3.6 Waste Management Activities

	Presence / Location	**Comments**
BGS / EA / Local Authority Recorded Landfills (within 1km)	There is one recorded historical landfill, Brackenhall Dam, located 264 metres to the north of the site.	The Brackenhall Dam site was operated by Kirklees MBC and was active between 1984 and 1986, licensed for the deposit of inert and commercial waste. An additional record relating to this site records the authorised waste to be construction and demolition wastes and excavated natural material.
Other Licensed Waste Management Facilities (within 500m)	There was formerly a licensed waste transfer station, located 444m to the west of the site, operated by Kirklees Highways Services.	

	Presence / Location	Comments
Evidence of Landfilling On or Within 250m of Site	The former quarries both on site and in the adjacent areas are known to have been infilled previously.	
Walkover Evidence of Fly-Tipping on Site?	None noted, however a skip thought to be associated with the school to the north was recorded within the site, close to a gate along the northern boundary and the area appears to have been used for loading skips previously.	
Ground Gas Risk Assessment Required?	Yes. Hazardous ground gas associated with areas of deep made ground associated with backfilled quarries both on and adjacent to the site.	

3.6 Radon Risk

To determine whether the site is at risk from radon gas, the BRE Document "BRE 211 - Radon: Guidance on the protective measures for new dwellings" together with the National Radiological Protection Board (NRPB) "Radon Atlas of England and Wales" have been referenced.

These documents, together with a review of information obtained from Public Health England and British Geological Survey, state that the site lies within the zone in which less than 1% of properties are above the action level however, **no radon protective measures are required**.

3.7 Other

Other potentially contaminative activities or environmental constraints are listed below. The entries relate to activities within approximately 250m of the site, with the exception of Control of Major Accident Hazard (COMAH) and Notification of Installations Handling Hazardous Substances (NIHHS) facilities where the assessment is extended to a distance of approximately 1km from the site.

- There are four recorded "Local Authority Pollution and Prevention and Control" permits recorded within 250m of the site. The nearest of these is located 84m to the west and relates to manufacturing processes in on the Ash Brow Mills Site.

- There are six recorded pollution incidents to controlled waters within 250m of the site. Two of these are recorded as Category 3 (Minor Incidents), one is recorded as Category 2 (Significant Incidents) and three are recorded as Category 1 (Major Incidents). The nearest major incident was recorded 96m to the west of the site, relating to the discharge of 'other chemicals' to a freshwater stream (River Colne). There is one minor incident recorded on site, relating to an oil storage depot on Huddersfield Road, the actual location in relation to the site and any further details relating to this incident are unknown.

- There are two active contemporary trade directory entries located within 250m of the site, the nearest relating to a plastic products manufacturer located 84m to the west on the Ashbrow Mills site, and the other relates to an automotive garage 90m to the southwest on Ashbrow Road.

- No COMAH or NIHHS facilities are recorded within 1km of the site.

- There is a TPO area within the site along the eastern portion of the southern boundary, as indicated on Drawing No. C6944A/02 within Appendix A.

3.8 Regulatory Correspondence

Enquiries made to Kirklees Council Environmental Health Department returned the following pertinent information:

- One historic landfill (Grid Ref: SE 149 197) is located within 500m of the site. The site is known as Brackenhall Dam on Bradford Road.

  The West Yorkshire Waste Management Waste Disposal Licence (No 445) was held by Kirklees Metropolitan Council. The facility was permitted to accept construction and demolition wastes including excavation waste. Excluded waste type details are not provided. The license was issued on 16th August 1984 and cancelled on 15th June 1990.

- Neither this site nor any in the vicinity have been determined as contaminated land under the provisions of Part 2A of the Environmental Protection Act 1990. A number of adjacent sites including Ashbrow Mills, the former quarry to the south west and the former pond to the north were identified for eventual future potential inspection under Part 2A of the Environmental Protection Act 1990 in accordance with Kirklees Contaminated Land Strategy. However , it is stated that it is unknown when this may occur or if these site will be included in future investigations.
- Available information indicates that there are no records of reported spillages or other incidents associated with the site or neighbouring premises.
- Environmental health records indicate that there are no private water abstractions within 1km radius of the site.

4. PREVIOUS INVESTIGATION FINDINGS

A previous desk study investigation has been undertaken for the site by Rogers Geotechnical Services Limited (RGS) and made available to Sirius. The report has been reviewed and any salient points have been referred to within Section 3.

5 PRELIMINARY CONCEPTUAL MODEL

Based on an assessment of the published information, a combined preliminary conceptual site model and conceptual exposure model (CSM) has been developed for the proposed future land-use (residential with gardens). This summarises the understanding of surface and sub-surface features, the potential contaminant sources, transport pathways and receptors in order to assess potential pollutant linkages. In assessing the likely contaminants present at the site, reference has been made to the Industry Profile report series issued by the Department of the Environment and other relevant supporting documentation.

A qualitative risk assessment has also been made of the likelihood of any pollutant linkage operating and its potential significance.

The preliminary conceptual model is presented in schematic form as Drawing No.C6884/03 in Appendix A.

In summary, the preliminary CSM has identified the following potential pollutant linkages, which could result in an unacceptable risk to the proposed end-use:

- Ingestion, inhalation of dust, and dermal contact with potential heavy metals, asbestos fibres, hydrocarbons (including polyaromatic hydrocarbons (PAH)) in made ground, topsoil and shallow natural soils posing a **low to moderate** risk to site end users, adjacent site users, construction workers, and the proposed development and landscaping.

- Possible leachable heavy metals and organic contaminants in made ground and/or shallow natural soils posing a **low to moderate** risk to controlled waters (underlying Secondary A Aquifer).

- Risk from hazardous ground gas sources, associated with areas of deep made ground and landfills located both on and off site, posing a **moderate to high** risk to proposed end users and the proposed built development.

- Attack of construction materials (concrete and plastic) by sulphates and organic contaminants, posing a **low to moderate** risk to the built environment.

  Invasive plant species may be present on or adjacent to the site but will pose a **low** risk to the built environment <u>provided that an appropriate survey and method of treatment/removal has been/will be undertaken.</u>

6 FIELDWORK

6.1 Scope of Investigation

The information contained in this report is limited to areas of land accessible during the investigation within the site boundary, as indicated on the site plan, presented in Appendix A as Drawing No. C6944A/02.

Sirius scoped the intrusive ground investigation using guidance presented in BS5930:1999+A2:2010, BS10175:2011+A1:2013 and BS EN 1997:2004 and 2007.

The investigation was supervised by a Sirius Geoenvironmental Engineer and undertaken in a single phase carried out from 28th April to 6th May 2016 and comprised the formation of:

- Seventeen window-sample boreholes (WS101 – WS116, inclusive of WS108A) drilled to a maximum depth of 5.00m bgl.
- Twenty-three mechanically excavated trial pits (ref. TP101 to TP121, excluding TP113, and SA101 to SA103) to a maximum depth of 2.90m below ground level (bgl).
- Soakaway testing was undertaken within three trial pits (SA101 – SA103).

Gas and groundwater monitoring wells were installed within ten selected window sample boreholes (WS01-05, WS07, WS8A, WS9-10 and WS13).

The locations of the exploratory holes are shown on Drawing No. C6944/04 in Appendix A.

6.2 Strata Description

Detailed descriptions of strata and groundwater observations made during investigation works, together with samples recovered, are presented on the Engineer's exploratory hole records in Appendix F.

Standard strata descriptions are compliant with BS EN ISO 14688:2002 and 2004 and BS EN ISO 14689:2003. The depths of strata on the record sheets are recorded from current ground levels at each location, unless indicated otherwise.

6.3 Exploratory Hole Locations

The exploratory hole locations were based on the findings of the preliminary conceptual site model in order to target specific areas of interest and achieve a general site coverage. Procedures and principles recommended in CLR4, BS 10175:2011+A1:2013 and BS EN 1997: 2007 were followed when determining exploratory hole locations.

Exploratory hole locations are shown on Drawing No. C6944/04 in Appendix A of this report.

6.4 Access Constraints

Exploratory hole positions were restricted in certain areas of the site by ecological constraints including nesting birds and TPO's, as well as due to the topography (steep slopes). Trial pit TP113 was not excavated due to restricted access to the site from to the south via Ashbrow Road.

6.5 Geotechnical Testing

Geotechnical laboratory testing was carried out on selected samples in accordance with techniques outlined in BS 1377:1990 "Methods of Test for Soils for Civil Engineering Purposes" at Professional Soils Laboratory (PSL), a UKAS accredited laboratory.

Geotechnical and geochemical test results are included within Appendix F of this report.

6.6 Chemical Testing

Selected samples of the soil (made ground and natural ground), groundwater and surface water were tested for a range of potential contaminants under subcontract with Derwentside Environmental Testing Services (DETS), a UKAS and MCERTS accredited laboratory.

The potential contaminants of concern identified by the preliminary conceptual site model were selected as the analytes for the samples recovered from the site. The results of soil, leachate, groundwater and surface water analysis, as received from the laboratory, are also presented within Appendix F of this report.

7 GROUND CONDITIONS AND MATERIAL PROPERTIES

7.1 Strata Profile

A summary of the strata profile encountered at the site is provided in Tables 7.1 below.

Table 7.1 Strata Profile

Strata	Depth Range (Thickness Range)	Description and Comments
Topsoil	GL (0.10 - 0.60m)	The site was generally found to be underlain by a 0.30m thick surface covering of topsoil, typically comprising slightly gravelly, sandy, silt. The gravel component typically comprised fine to coarse, angular to sub-angular sandstone. Reworked topsoil was encountered within the former quarry areas (WS107, WS109 and TP112) and within TP114 and TP118 close to the northern boundary, locally found to contain inclusions of brick, clinker and plastic.
Made Ground (Quarry Backfill)	0.10 – 0.30m (1.50 – >4.60m)	Reworked natural soils (made ground), typically comprising soft, low strength, sandy, gravelly clay overlying loose to medium dense, silty, sandy, gravel with cobbles and occasional boulders was encountered beneath reworked topsoil within the vicinity of the former quarried areas (WS107, WS109 and TP112), proven to a maximum depth of 2.50m bgl and potentially extending beyond 5.00m bgl in WS109. The granular component typically comprised fine to coarse angular to sub-angular sandstone and siltstone.
Residual Soils/ Weathered Bedrock	0.20 – 0.60m (>5.0m)	Natural topsoil (and reworked topsoil in TP114 and TP118) was generally found to be underlain by natural completely weathered / residual bedrock of the Elland Flags, typically comprising dense becoming very dense silty, sandy, gravel with cobbles and boulders proven to a maximum depth of 3.00m bgl. The granular component typically comprised fine to coarse angular to sub-angular sandstone and siltstone. Locally, cohesive natural soils comprising firm to stiff, medium to high strength, slightly sandy, gravelly, clay were encountered to depths of between 0.40 and greater than 1.60m bgl.

Strata	Depth Range (Thickness Range)	Description and Comments
		The gravel component typically comprised fine to coarse angular to sub-angular sandstone.

NR -not recorded

7.2 Material Properties

Made Ground – Quarry Backfill

3 No. Standard Penetration Tests (SPTs) undertaken within the quarry backfill soils recorded 'N' values of between 4 and 7 (mean and median N value of 5), indicative of loose material. A further 4 No. SPTs performed within possible quarry backfill ranged from 8 to 24 (mean and median N of 15)

Particle size distribution (PSD) analysis was undertaken on a sample of the quarry backfill material obtained from trial pit TP112 at a depth of 1.20m to 1.50m bgl. The PSD results indicate the material to comprise slightly sandy slightly clayey gravel with a low cobble content in accordance with BS EN ISO 14688:2002 and 2004 and BS EN ISO 14689:2003.

Water soluble sulphate (SO_4) analyses performed on two samples of the quarry backfill material recorded concentrations of between <10mg/l and 13mg/l, together with recorded pH ranging from 6.2 to 7.3. These results indicate a design sulphate class of DS-1 and an ACEC class of AC-1, in accordance with BRE Special Digest 1 (2005) for the design of buried concrete, based on brownfield site designation and mobile groundwater conditions.

Made Ground – Reworked Topsoil

Water soluble sulphate (SO_4) analyses performed on four samples of the reworked topsoil material recorded concentrations of between 13mg/l and 130mg/l, together with recorded pH ranging from 6.1 to 7.3. These results indicate a design sulphate class of DS-1 and an ACEC class of AC-1, in accordance with BRE Special Digest 1 (2005) for the design of buried concrete, based on brownfield site designation and mobile groundwater conditions.

Natural Soils

Water soluble sulphate (SO_4) analyses performed on nine samples of natural soils (including topsoil and residual soils), recorded concentrations of between <10mg/l and 22mg/l, together with recorded

pH conditions ranging from 5.5 to 7.1. These results indicate a design sulphate class of DS-1 and an ACEC class of AC-1, in accordance with BRE Special Digest 1 (2005) for the design of buried concrete, based on brownfield site designation and mobile groundwater conditions.

Cohesive Residual Soils

Atterberg Limit determination undertaken on five samples of the cohesive residual soil indicates the material tested to be clay of intermediate plasticity, with liquid limits ranging between 37% and 43%, plastic limits ranging between 21% and 25% and a plasticity indices ranging between13% and 18%.

Calculation of the modified Plasticity Index, in accordance with NHBC standards, indicates the material to have a low volume change potential.

The Consistency Index (Ic) value for the samples tested ranged from 1.12 to 1.77, indicating the material to be of a very stiff consistency.

Two SPTs undertaken within the cohesive residual soil recorded 'N' values of 10 and 11.

Indicative undrained shear strengths of over consolidated cohesive soils can be derived by applying a correlation to SPT N_{60} values according to the materials plasticity, after Stroud (1975)[1]. Based on an average reported modified plasticity index of 18% (using the results of Atterberg limit determination tests), a correlation factor of 5.5 can be derived. Using Stroud's correlation, the SPT N_{60} values obtained are indicative of undrained shear strength values ranging between 55kPa and 60kPa, which is indicative of medium strength soil.

Granular Residual Soils

Ten SPTs undertaken within the granular residual soils recorded 'N' values of between 9 and 40 (mean and median values of 25 and 29, respectively), indicative of medium dense to dense material.

PSD analysis was undertaken on four samples of granular residual soil. The results indicate the material to comprise very silty sandy gravel and silty sandy gravel with a low cobble content l in accordance with BS EN ISO 14688:2002 and 2004 and BS EN ISO 14689:2003.

[1] Stroud, M. A. The standard penetration test in insensitive clays and soft rocks, *Proceedings of the European Symposium on Penetration Testing,* 2, 367 – 375 (1975)

Three laboratory CBR tests undertaken on recompacted samples of the granular residual soils obtained from TP108 at 0.50 – 0.70m bgl, TP110 at 0.70 – 0.80m bgl and TP116 at 0.50 – 0.70m bgl recorded CBR values of between 2.4% and 24.6%.

Bedrock

Fifteen in-situ SPTs undertaken within the competent bedrock, thought to comprise sandstones, siltstone and mudstone, recorded N values of 50 blows for between 30mm and 285mm penetration. These SPT N values indicate the material to range from extremely weak to medium strong rock.

7.3 Ground Stability

Trial pits were found to be generally stable during excavation.

7.4 Groundwater

Groundwater was not encountered within any of the exploratory holes formed during the investigation.

Subsequent groundwater monitoring has recorded all borehole installations to be dry with the exception of WS103 and WS105, which recorded water levels of between 1.69 and 2.93m bgl. This water is considered to be the result of surface water infiltration or perched water within the granular soils and not representative of the true groundwater level.

It should be noted that the water levels are likely to fluctuate with the seasons/rainfall and therefore may be significantly higher during wetter periods of the year, compared to those recorded during this investigation.

7.5 Soakaways

Three soakaway tests were undertaken in machine excavated pits SA01, SA02 and SA03.in general accordance with the test method specified in BRE Digest 365 - Soakaway Design. Water was added to the excavation, to fill the test zone, using a 5,000 litre tractor towed bowser.

Soakaway tests were undertaken in the residual soils and weathered bedrock. Infiltration speeds varied between the test locations. Soakaway test SA02 was repeated three times as defined within BRE 365. however, due to the slow speed of infiltration SA01 and SA03 were not repeated.

Plots of water level against time are provided on the soakaway test result sheets, contained within Appendix E of this report.

7.6 Visual / Olfactory Evidence of Contamination

No visual or olfactory evidence of hydrocarbon contamination was recorded during the excavation/drilling of the exploratory holes.

Made ground containing components of brick, clinker and plastic was encountered locally within the site, typically within the approximate vicinity of former quarrying operations and along the northern boundary with the school. These soils can contain elevated metals/metalloids and PAH.

7.7 Ground Gas

Ground gas monitoring has been carried out on two occasions to date and the results are summarised in Table 7.2. Full details of ground gas monitoring results are included in Appendix G.

Table 7.2 Summary of Gas Monitoring (2 visits to date)

Well	Peak Methane (range) %v/v	Constant Carbon Dioxide (range) %v/v	Oxygen (range) %v/v	Flow (range) l/hr
WS101	ND	0.9 – 1.8	18.8 – 19.8	ND
WS102	ND	0.5 – 0.9	19.7 – 20.4	ND
WS103	ND	0.8 – 0.9	19.8 – 20.0	ND
WS104	ND	0.5 – 1.3	17.4 – 19.8	ND – 0.6
WS105	ND	0.8 – 1.6	18.5 – 19.8	ND
WS107	ND	0.0 – 0.4	20.2 – 20.8	ND
WS108A	ND	0.2 – 0.7	20.3 – 20.7	ND
WS109	ND	0.5 – 1.0	19.8 – 20.4	ND
WS110	ND	1.0 – 1.6	19.8 – 19.9	ND
WS113	ND	1.0 – 2.2	18.5 – 19.2	ND

Results received to date (2 visits); ND Not Detected. Gas monitoring is currently on-going.

In addition to the above, non-detectable/low (<1ppm) concentrations of carbon monoxide (CO) and hydrogen sulphide (H_2S) have been detected.

The monitoring programme includes six visits over a three-month period (four visits remaining). On completion of the monitoring, a full set of results will be issued in an addendum letter.

8 RESULTS OF CHEMICAL TESTING

8.1 Assessment Methodology

The results of the laboratory testing have been compared against generic assessment criterion (GAC) values, the derivations of which are detailed in Appendix H.

For each potential contaminant of concern, analytical data for soil samples were evaluated against the relevant GAC. If one or more samples recorded contaminant concentrations that exceeded that GAC, then consideration was given to statistical analysis of data in accordance with the "Planning Scenario" approach described in CL:AIRE & CIEH (2008)[2]. However, statistical analysis has not been considered appropriate in this instance due to the heterogeneous nature of the made ground soils.

8.2 Soil Analysis

Results of chemical analysis are presented in full in Appendix F.

For this site, measured values were compared to GACs derived for a residential with gardens end use. Source data for all GACs are provided in Appendix H.

The chemical analysis results for soils and screening criteria assuming a residential with gardens end use are summarised in Table 8.1.

Table 8.1 Summary of Total Soil Concentrations.

Determinand	No. of Samples Tested	Range of Results (mg/kg unless specified)	US95	GAC (1% SOM)	No. of Samples >GAC	Sample Exceeding GAC
Metals						
Arsenic (inorganic)	11	4.1 – 23	NA	37	0	
Cadmium	11	0.1 – 0.9	NA	11	0	
Chromium (III)	11	12 – 54	NA	910	0	
Lead	11	17 – 230	NA	200	1	TP112@0.2m
Inorganic Mercury	11	<0.05 – 0.29	NA	40	0	
Selenium	11	<0.5 – 1.2	NA	250	0	

[2] CL:AIRE & CIEH "Guidance on Comparing Soil Contamination Data with a Critical Concentration", May 2008.

Determinand	No. of Samples Tested	Range of Results (mg/kg unless specified)	US95	GAC (1% SOM)	No. of Samples >GAC	Sample Exceeding GAC
Copper	11	17 – 77	NA	200	0	
Nickel	11	7.7 - 37	NA	180	0	
Zinc	11	40 - 250	NA	450	0	
Inorganics						
pH	15	5.5 – 7.3	NA	<5 - >9	0	
Total Sulphate	11	300 - 700	NA	2400	0	
Water Sol. Sulphate	15	<10 - 130mg/l	NA	500mg/l	0	
Speciated PAH						
Acenaphthene	11	<0.1 – 0.4	NA	200	0	
Anthracene	11	<0.1 – 0.4	NA	2300	0	
Acenaphthylene	11	<0.1 – 0.5	NA	170	0	
Benzo(a)anthracene	11	<0.1 – 2.4	NA	*b(a)p**	0	
Benzo(b)fluoranthene	11	<0.1 – 2.2	NA	*b(a)p**	0	
Benzo(k)fluoranthene	11	<0.1 – 1.4	NA	*b(a)p**	0	
Benzo(g,h,i)perylene	11	<0.1 – 2.2	NA	*b(a)p**	0	
Benzo(a)pyrene	11	<0.1 – 2.7	NA	2.1	1	TP112@0.2m
Chrysene	11	<0.1 – 2.5	NA	*b(a)p**	0	
Dibenzo(a,h)anthracene	11	<0.1 – 0.2	NA	*b(a)p**	0	
Fluoranthene	11	<0.1 –7.0	NA	280	0	
Fluorene	11	<0.1 – 0.8	NA	170	0	
Indeno(1,2,3-cd)pyrene	11	<0.1 – 2.6	NA	*b(a)p**	0	
Naphthalene	11	<0.1 – 0.4	NA	1.0	0	
Pyrene	11	<0.1 – 6.2	NA	620	0	
Phenanthrene	11	<0.1 – 6.8	NA	95	0	
Speciated TPH						
Aliphatic EC 5-6	3	<0.01	NA	24	0	
Aliphatic EC >6-8	3	<0.01	NA	53	0	
Aliphatic EC >8-10	3	<0.01	NA	13	0	
Aliphatic EC >10-12	3	<1.5	NA	62	0	
Aliphatic EC >12-16	3	<1.2	NA	510	0	
Aliphatic EC >16-35	3	<4.9 – 52.5	NA	41000	0	
Aromatic EC 5-7	3	<0.01	NA	53	0	
Aromatic EC >7-8	3	<0.01	NA	100	0	
Aromatic EC >8-10	3	<0.01	NA	20	0	
Aromatic EC >10-12	3	<0.9	NA	63	0	
Aromatic EC >12-16	3	<0.5	NA	140	0	
Aromatic EC >16-21	3	<0.6 – 4.9	NA	260	0	
Aromatic EC >21-35	3	<1.4 – 130	NA	1100	0	
BTEX & MTBE						
Benzene	6	<0.01	NA	0.063	1	
Toluene	6	<0.01	NA	100	0	
Ethylbenzene	6	<0.01	NA	26	0	

Determinand	No. of Samples Tested	Range of Results (mg/kg unless specified)	US95	GAC (1% SOM)	No. of Samples >GAC	Sample Exceeding GAC
Xylenes (total)	6	<0.01	NA	28	0	
MTBE	6	<0.01	NA	31	0	
Others						
Phenol	11	<0.3 – 0.6	NA	110	0	
TOC	11	0.1 – 4.6	NA	3 w/w%	3	TP101 @ 0.1m TP112 @ 0.2m TP118 @ 0.3m
Asbestos	10	NAD - AMOSITE	NA	Fibres present	1	TP114 @ 0.3m

Table based on a Residential with Gardens end use (with consumption of homegrown produce). GAC - Stage 1 generic assessment criterion. * Assessed using benzo(a)pyrene as a surrogate marker, except where stated in text. # GAC has been derived in line with Sirius standard GACs. NAD – No Asbestos Detected. ^ Laboratory detection limits are higher than GAC values. NA - not applicable. LoD – Limit of Detection. MG - Made Ground

Metals and Metalloids

An elevated concentrations of lead, marginally in exceedance of the relevant GAC, was recorded in a single sample of reworked topsoil

No other metals recorded concentrations above the relevant GAC.

Inorganic Analytes

No other inorganic analytes recorded concentrations above the relevant GAC.

Organic Analytes

One sample of reworked topsoil from TP112 at 0.2m bgl returned a value just in excess of the Sirius "Stage 1" GAC for benzo(pyrene, but was noted to be below the Sirius "Stage 2" GAC of 4.9mg/kg. There is no visual or olfactory marker associated with this elevated concentration and the CSM has not identified any potential sources. Notwithstanding the above, in light of the predominant greenfield nature of this site, the topsoil description in question, does not differ from that from other trial pit locations, it is considered this test result is a rogue value. In addition, the maximum recorded concentration for benzo (a) pyrene does not exceed Category 4 Screening Values, as would be used to determine land as contaminated under the auspices of EPA Part IIA. Based on this premise, it is considered benzo (a) pyrene is not a risk to this site.

Use of the Sirius Stage 2 GACs notwithstanding, assessment of the PAH results by means of double-ratio plot analysis (a copy of which is included within Appendix F) indicates that the elevated levels of PAH identified within the samples of made ground and reworked topsoil is coal derived. The relative level of risk posed to human health by these PAHs within a coal matrix will be notably lower than for other sources of PAH.

Total Organic Carbon (TOC) was recorded at concentrations exceeding the relevant GAC within three topsoil samples, noted to contain organic materials. The GAC for TOC is based on the Hazardous Waste (England and Wales) Regulations 2005. TOC content in itself does not represent a potential risk to human health. This GAC is provided for indicative assessment of disposal options, in the case that off-site landfill of soil is undertaken. This GAC is specified at the 'Inert' waste threshold and should therefore be considered for information purposes only.

No other organics recorded concentrations above the relevant GAC.

Asbestos

One sample of mixed cohesive made ground obtained from TP114 at 0.3m bgl was identified in the laboratory to contain a small bundle of amosite fibres.

UKWIR Analysis

Analysis of selected samples was undertaken in line with the guidance provided by the United Kingdom Water Industry Research (UKWIR) to assess the suitability of material in relation to water services. A range of determinands where analysed for and compared to a series of published threshold values provided for polyethylene (PE) pipework. The results of analysis were noted to be below the relevant threshold values with the exception of a single sample of made ground from WS109 within a former quarried area which recorded a Mineral Oil (C11-C20) value of 17mg/kg. exceeding the threshold for PE pipework of 10mg/kg.

8.3 Leachate Analysis

Given the site setting, consideration has been given to both groundwater and surface water as potential controlled water receptors. The results of leachate and groundwater analysis have therefore been evaluated against GACs based on both Drinking Water Standards (DWS) and Inland Waters Environmental Quality Standards (EQS).

The derivation of the GAC values is described in Appendix J.

The results of the soil leachate analyses and the outcome of screening are summarised in Table 8.4 below.

Table 8.4 Summary of Leachate Analysis

Determinand	No. of Samples Tested	No. Samples Above Limit of Detection	Range of Results (µg/l unless specified)	GAC value (µg/l unless specified)		No. of Samples >GAC
Metals				**EQS (Note 1)**	**DWS (Note 2)**	
Arsenic	3	3	0.19 – 0.51	50	10	0
Cadmium +	3	0	<0.03	0.08	5	0
Chromium	3	2	<0.25 – 0.40	4.7	50	0
Lead	3	2	<0.09 – 0.58	1.2	25	0
Mercury*	3	3	0.01 – 0.02	0.07	1	0
Copper +	3	3	0.5 – 0.8	1	2000	0
Nickel	3	0	<0.5	4	20	0
Zinc +	3	3	1.3 – 4.4	10.9	5000	0
Organics						
Naphthalene	3	0	<0.01 – 0.24	2	NA	0
Benzo(a)pyrene*	3	3	0.01 – 0.02	0.00017	0.01	3
Anthracene	3	0	<0.01	0.1	NA	0
Fluoranthene*	3	3	0.01 - 0.02	0.0063	NA	3 (EQS)
Sum of benzo(b)fluoranthene and benzo(k)fluoranthene	3	1	<0.02 – 0.04	0.03	NA	1 (EQS)
Sum of benzo(ghi)perylene and indeno(1,2,3-cd)pyrene*	3	3	0.02 – 0.06	0.002	NA	3 (EQS)
Phenol * #	3	0	<0.5	7.7	0.5	0

NA – Not Applicable
+ - EQS is hardness related
1 - Inland Waters EQS values
2 - DWS values
* - Laboratory detection limits are higher than EQS values.

Metals and Metalloids

No concentrations of leachable metals were recorded in exceedance of their respective GACs.

Organics

Elevated leachable concentrations of PAH (including benzo(a)pyrene) were recorded to exceed the relevant EQS and DWS standards in three samples of made ground.

It is considered, however, that laboratory leachate testing is not truly reflective of natural hydraulic processes, but represents a much more aggressive process that results in elevated concentrations of leachable determinands being identified. With this in mind, the fact that elevated contaminant concentrations are marginal in nature, the fact that groundwater has not generally been encountered within the residual soils and on the basis that a good proportion of the site will be hard surfaced, thereby limiting surface water infiltration and leachate generation, the identified concentrations are considered not to pose a significant risk to controlled waters, and are not considered further.

9 REVISED CONCEPTUAL MODEL AND GENERIC QUANTITATIVE RISK ASSESSMENT OF POLLUTANT LINKAGES

The preliminary combined conceptual site model and conceptual exposure model, developed from the preliminary assessment and presented in Section 5, has been revised in light of the ground investigation and the chemical analysis results presented above.

The revised conceptual model has been developed for the proposed future land use (residential with gardens). This summarises the understanding of surface and sub-surface features, the potential contaminant sources, transport pathways and receptors.

In summary, the revised CSM has identified the following potential pollutant linkages which could result in an unacceptable risk to the proposed end-use.

- Ingestion and inhalation of, and dermal contact with locally impacted made ground soils containing elevated concentrations of lead, posing a **moderate** risk to future site users and construction workers.

- Inhalation of asbestos fibres, identified locally within the reworked topsoil in the vicinity of TP114, posing a **moderate to high** risk to site end users, adjacent site users and construction workers unless the impacted soils are below hardstanding or clean cover soils.

- Risk from hazardous ground gas sources, associated with areas of deep made ground and landfills located both on and off site, posing a **low** risk to proposed end users and the proposed built development. **A full risk assessment will be provided upon completion of the remaining monitoring visits, presented in an addendum letter report**.

10 CONCLUSIONS AND RECOMMENDATIONS

10.1 General

This geoenvironmental appraisal has been performed for land located off Ashbrow Road, Huddersfield.

The site is unoccupied and largely previously undeveloped, with areas of historical quarry workings along the southern and western boundaries which have subsequently been partially or wholly infilled.

It is understood that consideration is being given to the development of the site for a low rise (two and three storey) residential end use. The proposed development is understood to comprise houses with private gardens, associated areas of public open space (POS) and highways. No proposed development layout has been provided for the purpose of this appraisal and no loadings or development levels were known at the time of writing. Consideration should be given to the site topography, in particular the steeply sloped areas when proposing the development layout of the site

In the absence of a detailed development layout and finalised levels, recommendations for foundation, floor slab and highway design are necessarily generalised.

10.2 Flood Risk

According to the Envirocheck Report and the EA website, the site does not lie within an indicative flood plain (Zone 2 or 3) at risk of flooding from rivers or sea.

10.3 Geotechnical

Mining and Quarrying

Based on published geological records and CA mining report the site is considered to be at negligible risk from surface instability associated with shallow coal mining.

Two backfilled former quarries are present along the southern and western site boundaries, associated with the extraction of sandstone (Elland Flags of the LCM). Exploratory holes formed within the quarry areas encountered backfill materials to a depth of 2.50m bgl, potentially extending to depths in excess of 5.00m bgl.

The exact extent of excavations and location of the highwalls associated with the former quarries has not been determined by this investigation. At this stage only their approximate locations can

be inferred from historical information and the results of the intrusive investigation. The approximate line of the high walls is shown on Drawing No C6944/02 in Appendix A. Prior to finalising foundation solutions for individual plots, it is recommended that a more detailed assessment/location of the high walls be made with respect to plots in the locale of the anticipated high wall to either assess the foundations required or to relocate plots to avoid spanning the high wall.

Other than the two detailed above, no other quarries or gravel pits are known to exist on the site. However, the possibility of encountering unrecorded quarries cannot be fully discounted. It is therefore recommended that all excavations be examined for evidence of such infilled features. If evidence of a quarry, pit or ground disturbance is suspected, advice regarding treatment / foundation precautions should be sought from a suitably qualified engineer.

Based on the desk based information it is considered that the risk to surface stability associated with unrecorded shallow Elland Flag mineworkings is very low.

Foundations

Intrusive works undertaken have revealed the undeveloped areas, which comprise the vast majority of the site, to be underlain by a relatively homogenous shallow soil profile typically comprising topsoil over medium dense and dense granular residual deposits, and locally firm to very stiff, medium and high strength residual clay, to depths of between 0.80m and 3.00m.

The former quarry areas were recorded to contain backfill material to depths ranging from 2.50m to greater than 5.0m and comprising soft, low strength sandy, gravelly clays overlying loose to medium dense silty, sandy, gravel of sandstone with varying proportions of sandstone cobbles and boulders.

Both the quarry backfill and residual soils were found to be underlain by weathered sandstones of the Elland Flags Formation and LCM.

The quarry backfill is considered unsuitable to support foundations owing to being variable, and of low strength and consistency, leading to the potential for unacceptable total and differential settlements and an unacceptably low bearing resistance. Foundations for any proposed development should therefore be extended through these soils to bear onto/into underlying competent/natural strata of adequate strength / density / bearing resistance.

For the site as a whole, foundation solutions will be dependent on the plot location, loadings and proposed development levels. In addition, the following recommendations assume there are no underground workings within the Elland Flags which could potentially have extended beneath the site from the historic quarries wall. Assuming that site levels will remain broadly consistent with those at the time of the investigation two foundation scenarios are foreseen:

Spread Foundations - Strip and Trench Fill Foundations (<2.5m depth).

Within the undeveloped areas, and where quarrying/backfilling has not been undertaken, it is recommended that loads associated with lightly loaded structures such as residential dwellings are supported upon spread (either strip and trench fill) foundations which bear upon underlying residual soils (at least firm and medium strength cohesive or medium dense granular deposits) and/or, competent bedrock at an anticipated minimum founding depth of 0.75m below existing or finished ground level, whichever is the lower of the two.

For foundations constructed on medium dense soils, a minimum angle of shearing resistance (Φ') of 30º could be assumed. For preliminary foundation design and in accordance with Eurocode 7, a 0.60m wide strip footing at a depth of 0.75m bgl could support a design loading of 80kN/m run. Calculations indicate that for the above foundation size and loading scenario, settlement should be below 25mm.

Where foundations are constructed on cohesive soils, for preliminary design, a 0.60m wide strip founded on firm medium strength clay (assuming a characteristic undrained shear strength (Cu) of 55kPa) placed at an anticipated founding depth of 0.75m bgl, could support a design loading of 80kN/m run. The application of such loading is anticipated to keep consolidation settlement below 25mm.

Based on laboratory testing obtained as part of this investigation, the residual clay can be classified low shrinkability in accordance with NHBC Standards Chapter 4.2. On this basis foundations should be placed into the natural cohesive soils at a minimum depth of 750mm below finished or original ground levels, whichever is the lower of the two, and locally deepened within the zone of influence of existing or proposed trees or hedges. A tree survey was not included in the scope of this

investigation, but should be carried out prior to the production of a detailed plot-specific foundation schedule.

Notwithstanding the above, cohesive residual soils were only encountered locally. The settlement characteristics of clay and gravel/sand are fundamentally different. It would be prudent for the foundation of an entire plot to bear upon a single/ consistent stratum i.e. cohesive, or granular deposits, in order to remove the potential for differential settlements occurring. Alternatively, in view of the lightly loaded nature of a residential dwelling, if individual plots cannot be feasibly constructed upon a consistent stratum at formation, then consideration could be given to longitudinal reinforcement of the strip, to mitigate the effects of potential differential settlements.

It is anticipated that competent bedrock may also be encountered at formation/ shallow depth. If foundation excavations encounter bedrock, it is recommended that the entire foundation bears upon this stratum, in order to limit the potential for unacceptable differential settlements. A design bearing pressure of 150kN/m^2 could be assumed for the sandstone or mudstone bedrock (at least extremely to very weak), assuming a 0.60m wide strip foundation. Should higher allowable bearing pressures be required, confirmatory testing should be undertaken.

The above calculations are based on theoretical foundations. Settlements of foundations are dependent on foundation loading and dimensions. It is therefore recommended that foundation settlements are reviewed by the design engineer when final loading arrangements and foundation sizes are known.

It is recommended that all foundation excavations are inspected by a suitably qualified engineer to confirm the suitability of the residual soil as a bearing stratum.

Foundations should be taken below a line drawn up at 45° from the base of any existing or proposed services.

In the event foundations bear upon any granular weathered bedrock these should be placed a minimum of 500mm below finished ground level to alleviate any effects arising from frost heave beneath the foundation.

Deeper Foundations (>2.5m bgl)

This section is of particular relevance to the vicinity of the former quarries, where a significant thickness of made ground soils exist (for example >2.5m). Made ground extending to this thickness generally precludes the use of shallow foundations. Consideration should therefore be given to the

use of deep foundations such as piles Alternatively, it is possible for granular backfill to be treated via a process of ground improvement, using techniques such as vibro replacement (installation of vibro stone columns).

The presence of large sandstone boulders within the quarry backfill could provide obstructions to piles and may require pre-boring. Notwithstanding the above, such obstructions should be accounted for in pile design. The design of the piles should be undertaken by a specialist contractor, using information obtained during this site investigation.

It must be ensured that piles do not introduce any preferential pathways for the migration of contaminants and the guidance given in the Environment Agency document 'Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention' should be followed and discussed with the Environment Agency prior to undertaking any piling operations.

General Considerations

Plots over the former highwall may experience unacceptable differential settlements, and will therefore require foundations to be advanced to natural ground. Depending on where the properties lie with respect to the highwall line, this often comprises a "hybrid" foundation solution consisting of spread foundations outwith the quarry area, but using trench fill, or piles, or building upon improved ground within the quarry. It is however, strongly recommended that use of such a foundation is discussed and approved with the NHBC prior to construction.

Floors

Undeveloped Areas

Within the undeveloped areas of the site, where competent, natural ground is encountered at shallow depth and subject to a full ground gas risk assessment, it is considered that ground bearing floor slabs could be utilised across most of site.

It is recommended as a minimum, the topsoil is removed from beneath the floor plan area of each plot and the floor constructed upon a layer of well compacted, clean, inert hardcore.

Locally suspended floor slabs may be required should a significant thickness (>600mm) of made ground be encountered, where low strength/loose natural soils are encountered and/or cohesive

soils are encountered which may be prone to swelling (i.e. within the zone of influence of existing or proposed trees or hedges).

Quarry Areas

Within the quarry areas, where made ground was found to be greater than 600mm in thickness, it is recommended that suspended floor slabs be assumed for the proposed development.

Floor slab design will require construction which addresses any requirements for ground gas mitigation measures which are discussed later in this report.

Sulphate Attack

Based on the laboratory testing undertaken as part of this ground investigation, and in accordance with BRE Special Digest 1 (2005), assuming brownfield and mobile groundwater conditions, a Design Sulphate Class of DS-1 and an ACEC Class of AC-1 should be used for buried concrete structures in contact with made ground and natural soils.

Groundworks, Excavation Stability and Groundwater

Based on laboratory test results, the disturbed samples of natural granular deposits (described in accordance with BS5930:1999+A2:2010 as silty sandy gravel or clayey sandy gravel) are classified as “granular material 1B/1C” in accordance with Highways Agency (HA) publication “Specification for Highway Works Series 600, Earthworks”.

Excavations should be assumed to be unstable. No man entry into unsupported excavations should be allowed without an appropriate risk assessment. Reference to CIRIA report 97 (1983) should be made to establish suitable means of support or battering of excavation sides.

Based on the results of this investigation, seepages or minor inflows of groundwater/perched water within shallow excavations (<2.50m) may occur locally. It should be possible to deal with these seepages through normal site pumping practices for any shallow excavations open for short periods of time. Within deeper excavations (>2.50m bgl), a dewatering well point system may be required to maintain stability of the excavation and to control groundwater inflows. Disposal/discharge of water will require appropriate treatment/consent.

It is recommended that an adequate drainage system for surface water be installed by a competent contractor in order to prevent surface water ponding or collecting both during and post-construction, as this may lead to deterioration of the founding stratum.

Competent bedrock strata are anticipated at shallow depth localised areas of the site. For deep excavations, competent bedrock may require breaking-out using heavy mechanical plant. Hydraulic breakers may be required along foundation trenches to avoid over break of the competent sandstone and mudstone rock.

Slope Stability

Much of the site is sloped including the western area which slopes at an angle of up to 1 in 4 down to the west where the lower slope area is heavily vegetated. The southern-central site area generally slopes to the south at angles up to 1 in 8, in addition to an approximately 4m high heavily vegetated slope, at an angle of 1 in 2, located along the south eastern site boundary associated with construction of the adjacent highway. Detailed stability assessments of these slopes are outwith this investigation. However, provisional recommendations are discussed below.

Although the slopes appear generally stable, localised failures, such as shallow slumping and unravelling although not observed may still occur due to localised over steepening, or due to water collection/migration paths. The existing vegetation cover is likely to be assisting in mitigating the effects of localised failures at present, and any proposals to amend the vegetation cover in any way should be carefully considered.

Pavements and Highways

Based on a visual examination of the shallow soils and laboratory testing (including CBRs and Atterberg limit tests), a preliminary CBR value of <3% is suggested for a sub grade comprising residual soils.

It is however recommended that in-situ CBR testing is carried out along the alignment of highways and hardstand areas following completion of the enabling works, when final site levels will be known. An allowance should be included for proof-rolling of roads and pavement formations, and excavation of any identified soft-spots and replacement with granular materials placed and compacted in layers.

Consideration should also be given to the relatively steep gradients which exist on site when designing the road layout.

Soakaways

Soakaway tests were undertaken within three trial pits SA101, SA102 and SA103 in order to determine indicative infiltration rates. At the time of the intrusive works, the invert level of the soakaway discharge pipes or soakaway bases were not known.

The infiltration rate is calculated from the gradient of the graph between 75% and 25% effective depth. The water level in soakaway tests SA101 did not fall to 75% of the effective depth. As a result a soil infiltration rate was not calculated for this soakaway test.

The results of the soakaway tests are summarised in Table 10.1:

Table 10.1 Soakaway Test Results

Trial Pit	Test Number	Soil Infiltration Rate (m/s)	Stratum
SA101	01	NA	Silty sandy GRAVEL (Weathered Sandstone)
SA102	01	1.29E-03	Sandy clayey GRAVEL (Weathered Sandstone)
	02	8.46E-04	
	03	4.74E-04	
SA103	01	1.35E-05	Sandy clayey GRAVEL (Weathered Sandstone)

Final soakaway design is to be undertaken by others, based on the results of the in-situ soakaway tests. The size of the required soakaway is a function of the area to be drained, anticipated rainfall and soil infiltration rate.

It should be borne in mind that water levels are likely to fluctuate with seasonal/rainfall and may vary significantly throughout the year and subsequently affect the capacity of soakaways.

It is recommended that the EA be consulted with respect to soakaway drainage for the site, as the underlying bedrock is classified as a Secondary A Aquifer.

10.4 Asbestos-Containing Materials

Asbestos-containing materials were identified within a single sample of reworked topsoil from TP114 at 0.30m bgl, located within northern part of the site in in an area noted for housing a waste skip and localised fly tipped material. This was identified as a ‘small bundle of Amosite fibres’.

Asbestos could potentially pose a risk to end users if disturbed and/or located within proposed gardens or areas of soft landscaping. As such, it is recommended that appropriate remedial measures are adopted, as detailed below in Section 10.5.

Asbestos has not been observed elsewhere, however it was noted that areas of fly tipped materials have been observed and in light of this potentially buried wastes cannot be precluded. As such, it is

recommended that during the enabling works, including the clearance of the vegetation, a watching brief should be maintained for the presence of any previously unidentified ACMs.

Construction workers involved in the groundworks and demolition/construction works during the site redevelopment are at **high** risk from asbestos given their more intensive exposure. These risks can be reduced by appropriate PPE and hygiene precautions and good working practices.

10.5 Soil and Groundwater Contamination

Risk Evaluation for the Proposed Land Use (Residential with Gardens)

The revised conceptual site model confirms significant pollutant linkages exist for site end users, construction workers and adjacent land users. Contaminant linkages assessed as posing Low or Negligible risk are not considered significant or requiring remedial action, and will not be discussed further.

Human Health Receptors

Localised elevated concentrations of lead and ACMs, have been detected within the reworked/made ground soils. At present, based on information gained from this investigation, these soils are considered to pose a risk to human health through dermal contact, dust inhalation and soil ingestion pathways.

The risks posed by hazardous ground gases are discussed in Section 10.6.

Controlled Waters Receptors

Given the fact that groundwater has not generally been encountered within the residual soils and on the basis that there is a significant unsaturated zone at shallow depth, the predominant greenfield nature of the site, the nature of the backfill within the former quarries, the proximity of controlled waters to the site, the site not being within a Source Protection Zone, in addition to a good proportion of the site likely to be covered by housing/ be hard surfaced, thereby limiting surface water infiltration and leachate generation, it is considered that the marginally elevated concentrations of leachable PAHs do not to pose a significant risk to controlled waters.

The above conclusions may need to be revised if, during enabling works, any visual/olfactory evidence of gross contamination in the soils is detected.

Utilities

Analysis of selected samples for a suite of determinands as prescribed by UKWIR was undertaken and the results were compared to published threshold guidance values provided for polyelthlene pipework. A single sample of made ground from one of the former quarry areas was noted to marginally exceed the guidance threshold for a single determinand. It is recommended that the results of this chemical testing and details of any proposed remedial works are provided to the appropriate utility companies to determine the necessity for service protection.

Construction and Maintenance Workers

Contamination may pose a short-term (acute) or long-term (chronic) risk to workers during construction and maintenance. The potential risks must be specifically assessed as part of the health and safety evaluation for the works to be performed in accordance with prevailing legislation. Site practices must conform to the specific legislative requirements and follow appropriate guidance (e.g., HSE, 1991; CIRIA, 1996).

Outline Remediation Requirements

In view of there being only a single elevated concentration of lead, which is marginally above the Sirius Stage 2 GAC, it is considered that should this material be placed under areas of proposed hardstanding (whether it be buildings or car parking/roadways) or beneath a capping layer of suitable thickness, no further remedial action is considered necessary to protect end users from direct contact/inhalation.

In view of the asbestos identified locally within the northern part of the site, it is recommended that as part of the enabling works, further samples be tested for the presence of asbestos to delineate this area and appropriate remedial measures taken if required. Should this additional testing confirm the presence of asbestos, as a minimum, a capping layer could be up to 1m thick and include a dense granular ‘no dig’ layer or geotextile marker layer along its base where asbestos impacted soils are present.

The thicknesses of the proposed capping layers are subject to regulatory approval. In view of this, it is recommended that the use of a capping layer in the asbestos contaminated area and, if required, the lead contaminated zone, be approved by the local authority, as a minimum, prior to construction.

General

Based on the results of the chemical testing undertaken as part of this ground investigation it is considered that the majority of the natural topsoil, and a proportion of reworked topsoil, is potentially suitable for reuse in gardens and/or areas of public open space proposed within this development. However, it is recommended that any site won topsoil should be stockpiled, sorted and further tested/assessed, as part of the enabling works, before being approved for re-use. Re-use of the topsoil in garden / landscaped areas etc. will require validation.

Where shallow bedrock has been encountered, and in line within NHBC Standard 2010 (Chapter 9.2), a suitable thickness of topsoil/subsoil should be placed within private garden/areas or soft landscaping, so that obstructions are not encountered within the upper 300mm. This thickness is subject to regulatory approval and, as such, should be agreed with the local authority and warranty provider prior to placement.

Any soils removed from site should be undertaken in accordance with the current Duty of Care regulations, the EC Landfill Directive and the EA Technical Guidance Document WM3, dated 2015. Chemical results should be forwarded to suitably licensed soil treatment centre and/or landfill operators to determine disposal options.

Based upon the results of this geoenvironmental appraisal, no remedial works are considered necessary to ensure the protection of controlled waters.

10.6 Ground Gas

The results of the gas monitoring visits undertaken to date have identified low detectable concentrations of carbon dioxide, no detectable concentrations of methane and generally no detectable flow rates.

Based on the gas monitoring results recorded to date, a worst case gas screening value of 0.013l/hr for carbon dioxide have been calculated. This worst case GSV is considered to be representative of Characteristic Situation (CS)1 as presented in BS8485-2015 and 'Green' conditions using the NHBC traffic light system for low-rise housing with a ventilated 150mm void. These classifications do not require special precautions with regard to ground gas.

The above assessments should be regarded as **interim only**, prior to completion of the monitoring programme. A further four gas/groundwater monitoring visits are programmed prior to finalising gas protective measures.

Radon protection measures are not currently required for the proposed development on this site.

Ground gas monitoring is on-going and the full results (along with updated conclusions) will be issued as an addendum letter on completion of the monitoring programme.

10.7 Invasive Plants

It is recommended that the absence of invasive plant species is confirmed by a qualified consultant ecologist and their advice taken on appropriate treatment. The treatment of any invasive species should take place in advance of the proposed construction works.

10.8 Disposal of Soils

Any materials removed from site should be undertaken in accordance with the Duty of Care Regulations 1991. There will also be a requirement to classify the waste in accordance with the European Waste Catalogue. The waste should also be subject to Waste Acceptance Criteria (WAC) testing. In light of the new regulations it is recommended that discussion with landfill operators takes place at an early stage.

11 REGULATORY APPROVALS

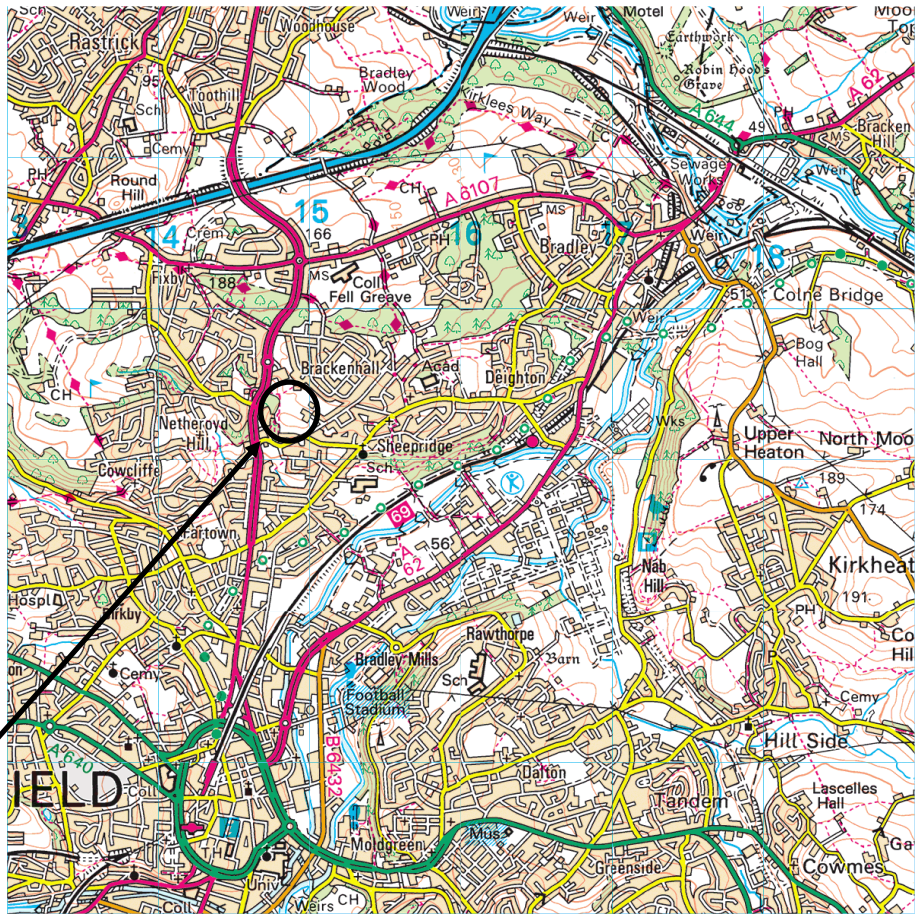
The conclusions and recommendations presented above are considered reasonable based on the findings of the site investigation. However, these cannot be guaranteed to gain regulatory approval and, therefore, the report should be passed to the appropriate regulatory authorities and/or other organisations for their comment and approval prior to undertaking any works on site.

APPENDIX A

FIGURES AND DRAWINGS

Site Location Plan

Contract Number	**C6944A**
Client	**KIRKLEES MDC, WATES LIVING SPACE, GALLIFORD TRY, KIER LIVING & KEEPMOAT HOMES**
Contract	**ASHBROW ROAD, HUDDERSFIELD**



THE SITE

Scale	**1:50,000**		
Drawn by	**RS**	**Approved**	**NI**
Drawing Number	**C6944A/01**		

NOTES

TPO AREA

HEAVY UNDERGROWTH

STEEPLY SLOPING

SKIP

EXISTING HIGHWALL

FORMER SANDSTONE QUARRIES

STEEPLY SLOPING

FORMER FUEL STORAGE AREA?

Ashbrow Infants & Nursery School

ASH BROW ROAD

CENTRAL AVENUE

ASH MEADOW CLOSE

BEECH TREE COURT

Issues

Sinks

Path (dm)

Nursery

Vicarage

TCB

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B	>>
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CLIENT

KIRKLEES MDC, WATES LIVING SPACE, GALLIFORD TRY, KIER LIVING & KEEPMOAT HOMES

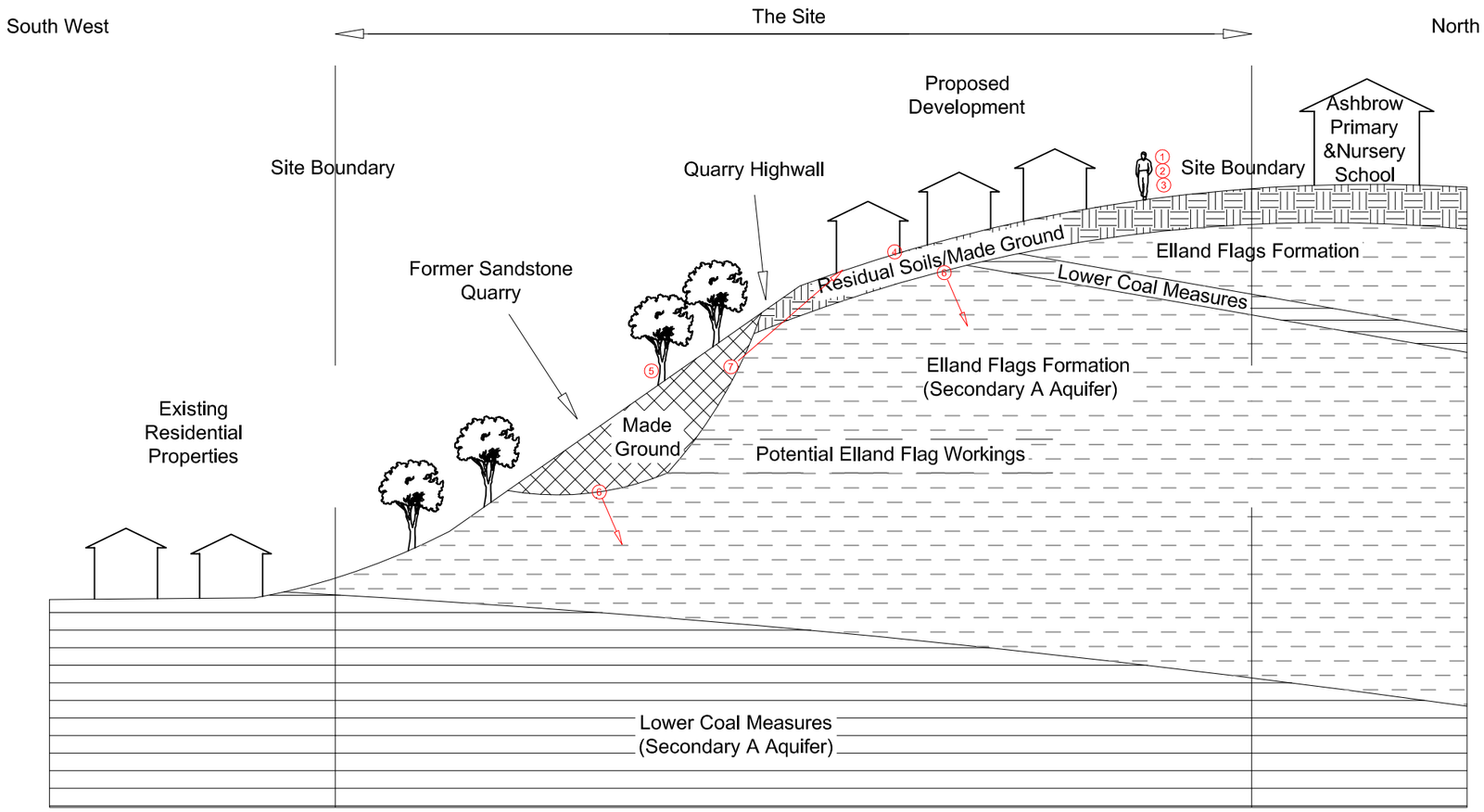
SITE

ASHBROW ROAD, HUDDERSFIELD

DRAWING TITLE

SITE FEATURES PLAN

DRAWING NO.	REVISION NO.
C6944A/02	0
DRAWN BY	APPROVED BY
GB	NI
DATE	SCALE	PAPER SIZE
June 2016	1:1000	A3



Contamination Sources	Contamination Pathways	Potential receptors	Likelihood of significant pollutant linkage
Elevated metals, inorganic and organic contaminants and asbestos within made ground and shallow soils	(1) Direct and indirect ingestion (2) Inhalation of contaminated particles/dust (3) Dermal contact (4) Sulphate attack (5) Plant Uptake	Construction workers/end users/adjacent site users Construction workers/end users/adjacent site users Construction workers/end users/adjacent site users Built environment Landscaping (Proposed/Existing)	Low - Moderate Low - Moderate Low - Moderate Low - Moderate Low - Moderate
Elevated leachable metals, inorganic and organic contaminants within made ground soils	(6) Migration via groundwater flow	Secondary A Aquifer	Low - Moderate
Hazardous gas sources associated with former landfill and deep areas of made ground.	(7) Gas Migration	Construction workers/end users/adjacent site users/built environment	Moderate - High

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CLIENT

KIRKLEES MDC, WATES LIVING SPACE, GALLIFORD TRY, KIER LIVING & KEEPMOAT HOMES

SITE

ASHBROW ROAD, HUDDERSFIELD

DRAWING TITLE

PRELIMINARY CONCEPTUAL SITE MODEL

DRAWING NO.	REVISION NO.
C6944A/03	0
DRAWN BY: SM	APPROVED BY: NI
DATE: June 2016	SCALE: NTS
PAPER SIZE: A3	

NOTES

- Window Sample Borehole
- Window Sample Borehole with Monitoring Well
- Trial Pit
- Trial Pit with Soakaway

WS101 W
TP101
WS102 W
TP102
WS103 W
WS105 W
WS104 W
TP106
TP105
TP103
SA102
WS106
TP104
TP114
TP108
TP115
TP107
WS110 W
WS112
WS116
WS107 W
SA103
TP109
TP116
TP117
SA101
TP118
TP112
TP111
TP119
WS111
WS115
TP120
TP110
WS108 W
WS108A W
TP121
WS114
WS109 W
WS113 W

Ashbrow Infants & Nursery School
Nursery
El Sub Sta
ASH MEADOW CLOSE
ASH BROW ROAD
CENTRAL AVENUE
BEECH TREE COURT
Vicarage
Path (dirt)
Issues
Sinks
115.8m
108.5m
164
148
TCB

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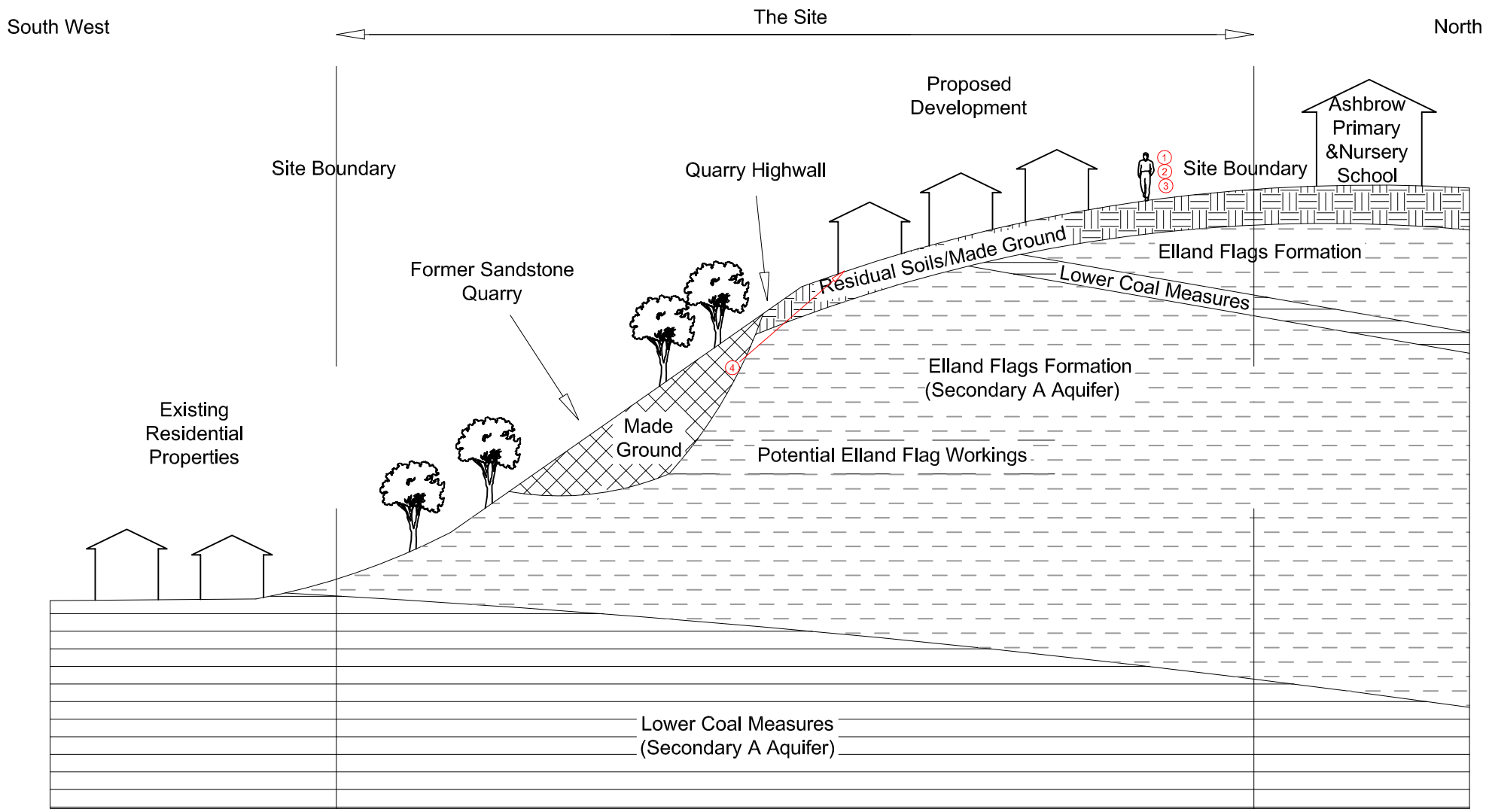
SITE

ASHBROW ROAD, HUDDERSFIELD

DRAWING TITLE

EXPLORATORY HOLE LOCATION PLAN

DRAWING NO.	REVISION NO.
C6944A/04	0
DRAWN BY	APPROVED BY
GB	NI
DATE	SCALE	PAPER SIZE
June 2016	1:1000	A3



Contamination Sources	Contamination Pathways	Potential receptors	Likelihood of significant pollutant linkage
Elevated metals within made ground soils	① Direct and indirect ingestion ② Inhalation of contaminated particles/dust ③ Dermal contact	Construction workers/end users/adjacent site users Construction workers/end users/adjacent site users Construction workers/end users/adjacent site users	Moderate Moderate Moderate
Asbestos within made ground soils	② Inhalation of contaminated particles/dust	Construction workers/end users/adjacent site users	Moderate - High
Hazardous gas sources associated with former landfill and deep areas of made ground.	④ Gas Migration	Construction workers/end users/adjacent site users/built environment	Low

NOTES

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CLIENT

KIRKLEES MDC, WATES LIVING SPACE, GALLIFORD TRY, KIER LIVING & KEEPMOAT HOMES

SITE

ASHBROW ROAD, HUDDERSFIELD

DRAWING TITLE

REVISED CONCEPTUAL SITE MODEL

DRAWING NO.	REVISION NO.
C6944A/05	0
DRAWN BY: SM	APPROVED BY: NI
DATE: June 2016	SCALE: NTS
PAPER SIZE: A3	

APPENDIX B

RGS DESK STUDY Inc. ENVIROCHECK REPORT & COAL AUTHORITY MINING REPORT

ROGERS GEOTECHNICAL SERVICES LTD

The Ground Investigation Specialists

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REPORT ON A PHASE ONE DESK STUDY

at

LAND ADJACENT TO ASHBROW INFANTS & NURSERY SCHOOL, ASH BROW ROAD, HUDDERSFIELD, HD2 1EX

for

KIRKLEES METROPOLITAN COUNCIL

Report No J2958/14/EDS
November 2014

CONTENTS

REPORT ON A PHASE ONE DESK STUDY

at

LAND ADJACENT TO ASHBROW INFANTS & NURSERY SCHOOL, ASH BROW ROAD, HUDDERSFIELD, HD2 1EX

for

KIRKLEES METROPOLITAN COUNCIL

Report No J2958/14/EDS **November 2014**

1. INTRODUCTION

The site is an area of open space situated to the south and southwest of Ashbrow Infants, Nursery and Junior School. It is in a largely residential area with some industry and commercial activity to the southwest and north. It is approximately 4.51 hectares in size and its National Grid reference is 414870, 419250. The client intends to develop the site by the construction of residential dwellings with gardens, driveways and access roads. In order to assist with the planning and construction processes and to provide an initial characterisation of the development area, a phase one environmental desk study has been commissioned and is the subject of this report. In accordance with issued guidance, a site walkover was conducted on the 7th November 2014 and the following observations were made:

- The site is accessed via the car park to the school, and comprises a large parcel of open ground with brambles, trees and hedges across the site and marking its boundaries.
- The northeastern portion of the site can be described as a plateau, as detailed by the marked contours on the 1: 10,560 historical maps, with the remainder of the site sloping steeply to the southwest and west. This would appear to be in accordance with the topography of the immediate area, which descends steeply from northwest to southwest.
- Foliage across the site appeared healthy and non-invasive in the areas that could be accessed where overgrowth was not significant. Please note that due to overgrowth, it was not possible to walk the whole of the site.

- The southwestern boundary of the site is marked by a dense wooded slope, at the bottom of which is a small industrial estate and garage. Beyond this, the land rises again towards Bradford Road, which descends from north to the south towards Huddersfield.
- The site is clearly used by the public for exercising dogs, and there was evidence of fires in some areas.
- No water sources/courses were observed on the site itself.
- The status of any underground services is unknown.

In order to ensure that the site is fully characterised and to comply with the Environment Act 1995[1], a Phase One Desk Study has been commissioned by Kirklees Metropolitan Council. The desk study is intended to assess the environmental impact of historical, current and future factors on the development. This report will present the data obtained and provide a conceptual ground model and preliminary risk assessment as well as discussing the scope of any intrusive investigation that may be required. This report does not consider ecological impacts (e.g. bats) or botanical risks (e.g. Japanese Knotweed).

2. REVIEW AND SUMMARY OF PUBLISHED DATA

As a part of this desk study the following data has been considered.

- Envirocheck Data - Appendix 1
- Historical maps - Appendix 2
- Site Plan - Appendix 3
- Photographs - Appendix 4
- Coal Authority Report

The data obtained from the above mentioned sources has been summarised below[2].

[1]S57 of the Environment Act 1995 inserted the contaminated land regime into the Environmental Protection Act 1990 (Part 2A). The regime **'provides a risk based approach to the identification and remediation of land where contamination poses an unacceptable risk to human health or the environment'** See http://www.environment-agency.gov.uk/research/planning/40405.aspx. This places a duty on local authorities to inspect their areas for contaminated land and require its remediation using the 'suitable for use' approach. Much of this duty is discharged via the planning regime under the Town and Country Planning Act 1990 as historical land contamination is a 'material planning consideration.' The local authorities are required to secure the removal of unacceptable risks via remediation of the land, to therefore ensure the site is suitable for its new use. This is fulfilled via completion of a Phase One Environmental Desk Study, Phase Two Intrusive Investigation, Phase Three Remediation Strategy and Phase Four Validation Report. Therefore, as a minimum, once a site has been developed it should not be capable of being designated as 'contaminated land' under Part 2A of the Environmental Protection Act 1990, as inserted by the Environment Act 1995 (see also PPS 23 Planning and Pollution Control Section 8)

[2] This report is a summary only and reference must be made in full to the information provided in the Envirocheck Report.

2.1 Historical Land Use

Table 1: *Historical Land Use*[3]

1854 - 1908	The site is an undeveloped expanse of fields with the exception of the very most southern boundary of the site where some houses are located. It is within a rural area, and situated on the edge of a sandstone quarry whose workings extend onto the western portion of the site. Within 250m there are the following notable businesses/industries/features: - Ash Brow Mills – immediately W. - Sandstone Quarry (in-filled by 1894) – 200m W.
1918 – 1978	The site remains developed and unchanged until 1948 when the on-site buildings are demolished and structures are begun to be erected within the on-site quarried area. Within 250m there are the following notable businesses/industries/features: - Ash Brow Mills – immediately W. - Tramway – immediately S. - Stream – 50m NW. - Groundworkings/pits – immediately NW and 100m SW. - Mills – 100m SW.
1979 – 2014	The site is now completely unoccupied. Within 250m there are the following notable businesses/industries/features: - Ash Brow Mills – immediately W. - Stream – 50m NW. - Groundworkings/pits (now open grassed spaces) – immediately NW and 100m SW. - Mills – 100m SW.

NB. All distances given are approximate only.

[3] See Appendix 2

2.2 Published Geology and Geological Hazards

Table 2: *Geological Data for the Site*

Strata Type	Strata Name[4]	Previous Name[2]	Description[5]
Superficial Geology	-	-	None recorded.
Solid Geology	Elland Flags	-	The Elland Flags consist of fine- to medium-grained flaggy to thickly bedded micaceous sandstone. The unit occurs as a number of sandstone leaves that are interbedded with dark micaceous and carbonaceous mudstone, locally containing thin dirty coals. This stratum is indicated to be present across much of the site.
	Pennine Lower Coal Measures Formation	Lower Coal Measures Lower Coal Measures Formation Grey Measures Of Yorkshire And Nottingham	Interbedded grey mudstone, siltstone and pale grey sandstone, commonly with mudstones containing marine fossils in the lower part, and more numerous and thicker coal seams in the upper part. This stratum is shown to intersect the Elland Flags across the middle of the site in a northwest-southeast direction. It is bounded to the north and south by the Elland Fllags.

The maps indicate the presence of a northeast to southwest trending fault, with the downthrow to the southeast, in close proximity to the southeast site boundary. In addition, they do not suggest that there are any coal seams to consider, although a Coal Authority report has been ordered.

- Potential for collapsible ground stability hazards – Very low.
- Potential for compressible ground stability – No hazard.
- Potential for ground dissolution stability – No hazard.
- Potential for landslide ground stability – Low to very low
- Potential for running sand ground stability – No hazard.
- Potential for shrinking or swelling clay ground stability – Very low to no hazard.

The Envirocheck Report states that the property is not in a Radon affected area, as between less than 1% of properties are above the action level for Radon. The BRE publication BR211 states that protection measures are therefore not necessary in the construction of new dwellings or extensions.

[4] Sources: British Geological Survey (NERC) Map Sheets 77; Huddersfield Solid and Drift Edition, Geology of Britain Viewer [*online resource from www.bgs.ac.uk*]
[5] Sources: British Geological Survey (NERC) Lexicon of Named Rock Units [*online resource from www.bgs.ac.uk*]

2.3 Construction Issues

2.3.1 Foundation Construction

On the basis of the prevailing geology and assuming that there are no areas of significantly filled ground, it is anticipated that shallow strip or spread foundations could be utilised at this site. It should be appreciated that an intrusive investigation will be required to validate this opinion. Additionally, any underlying mudstones are likely to have weathered to clay at or near the surface. Therefore, it is possible that adjacent to trees (existing or previously removed), the upper weathered zone could be desiccated, thus the proposed foundation depth could be in excess of 1m. Where sandstone outcrops, the upper levels are likely to be present as a sand, often clayey, which may be water bearing. This could result in local softening of the adjacent residual clays.

2.3.2 Site Won Materials

It would appear that residual mudstone is likely to be encountered at shallow depth over some of the site. This material is likely to be relatively difficult to re-engineer as a construction material. However, depending on the results of laboratory testing, it may possible to modify/stabilise the soil using lime and/or cement to form a suitable sub-base replacement for pavements and hard standings.

Where sandstone outcrops it is possible that the resulting soil may provide a suitable bulk fill and may prove suitable for re-compaction.

2.3.3 Disposal of Site Materials

If made ground is present then contamination/WAC testing will be required to establish the nature of the underlying soil before disposal to a licensed landfill site.

2.4 Mining

The Envirocheck Report states that the site is within an area that may be affected by coal mining. A Coal Authority mining report has therefore been ordered and can be summarised as follows:

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 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.

Furthermore, the site is not within the boundary of any past, present or likely opencast mining operations.

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.

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

2.5 Waste Management and Gas Monitoring

The Envirocheck report indicates that there are no waste management activities within 250m of the site.

However, the historical mapping did reveal on and off site quarries and groundworkings that may have been in-filled, and which may be considered to pose a risk of ground gas on the site.

On this basis, it is considered that gas monitoring would be prudent at this site to further assess any residual risk from these sources.

2.6 Hydrogeology, Hydrology

The Envirocheck Report and groundwater vulnerability map[6] suggests there is a Secondary A Aquifer within the solid geology beneath the site. This is defined as permeable layers capable of supporting water supplies at a local rather than

[6] See Appendix 1

strategic scale, and in some cases forming an important source of base flows to rivers.

The Envirocheck Report and groundwater vulnerability map[7] states there are no groundwater, surface water or potable water abstraction licences listed within 250m of the site.

There are a number of river network entries listed within 250m of the site, the nearest being related to the stream northwest and also an extended culvert 31m northwest.

The Environment Agency flood map[8] shows that the site is not at risk of flooding from rivers without defences.

2.7 Pollution Incidents to Controlled Waters

The Envirocheck Report reveals that there have been six pollution incidents recorded within 250m of the site, one of which occurred in 1989 on the eastern edge of the site and involved oils from an oil storage depot on Huddersfield Road. Whilst considered to be a minor pollution incident, this information should be used when formulating testing locations during intrusive investigation works.

The off-site incidents occurring within Ashbrow Mills to the west, in four cases involved chemicals, and were listed as major and significant incidents. It is not clear from the data how recent or not all of these events were, although two are known to have occurred in 1991.

There are no licensed discharge consents listed within 250m of the site.

2.8 Sensitive Land Use

According to the sensitive land uses map[9] there are no sensitive land uses within 250m.

Further mapping indicates that the site is not within a Source Protection Zone. Groundwater provides a third of our drinking water in England and Wales, and it also maintains the flow in many of our rivers. In some areas of Southern England, groundwater supplies up to 80% of the drinking water that we get through our taps. It is crucial that these sources are protected to ensure that the water is completely safe to drink.

Source Protection Zones (SPZs) for 2000 groundwater sources such as wells, boreholes and springs used for public drinking water supply have been defined by

[7] See Appendix 1
[8] See Appendix 1
[9] See Appendix 1

the Environment Agency. These zones show the risk of contamination from any activities that might cause pollution in the area and the closer the activity the greater the risk. When present, mapping will show three main zones; inner (SPZ 1), outer (SPZ 2) and total catchment (SPZ 3) and a fourth zone of special interest, which is occasionally applied, to a groundwater source.

2.9 Industrial Land Use and Potential Sources of Contamination

In order for a conceptual site model and preliminary risk assessment to be completed the historical maps and Envirocheck data requires analysis to identify any past or present activities on the site and in the area that may have the potential to cause contamination on the site. Guidance has been issued by the Environment Agency, NHBC and Chartered Institute of Environmental Health.[10] Within this document, annex 3 provides examples of important contaminants that are associated with individual uses of land. This data assists in the formulation of any chemical testing regime.

Those that we consider potentially contaminative according to the guidance are given below:

Table 3: *Potentially Contaminative Sources*

Details	Classification	Location relative to site
Artificial ground/historical construction	Made ground/fill	On site
Ashbrow Mills/Mills Lexcast Ltd	Unspecified works, factories or features	Immediately W/100m SW 14m NE
Ashbrow Garage Motosave Netherfield Service Station ASDA Huddersfield	Road vehicle servicing and repair: garages and filling stations	90m SW 227m SW 78m W 193m N
Clegg Wools Ltd	Textile works and dye works	109m SW
Tramway (hist')	Railway land	Immediately S

3. PRELIMINARY RISK ASSESSMENT

The potential of contamination hazards on the land has been identified and the risks associated with them are assessed in the following preliminary risk assessment in accordance with industry practice and the 'suitable for use' approach. This has

[10] Guidance for the Safe Development of Housing on Land Affected by Contamination, R&D Publication 66: 2008 Volume 1 and 2.

been conducted using the source-pathway-receptor approach. This method dictates that there must be a risk contaminant produced at a 'source' in sufficient concentration to cause harm and there must be a 'pathway' for the contaminant to reach an identifiable 'receptor' for the linkage to be proved and a contamination hazard to be considered present. Not all substances are contaminants and not all contaminants are considered to be a risk. Indeed DEFRA and The Environment Agency state that **'a contaminant is a substance which has the potential to cause harm, while a risk itself is considered to exist if such a substance is present in sufficient concentration to cause harm and a pathway exists for a receptor to be exposed to the substance.**'

R&D Publication 66: 2008 states that the groups at risk of harm (receptors) can be identified by the following categorisation:

1. Humans: site personnel, end users, visitors and adjacent land users.

2. The water environment – receptors: groundwater, surface water, coastal waters and artificial drainage.

3. Ecosystems: plants and animals.

4. Construction/building materials/services

In order to complete a conceptual site model and therefore a preliminary risk assessment, an appraisal of the sources of contamination, potential and actual, on and in the area of the site has therefore been completed with reference to this pollution linkage.[11]

3.1 Conceptual Ground Model

Although plans have not been finalised, it is anticipated that the site will be developed by the construction of residential dwellings with gardens, driveways and associated access roads. In view of the sensitivity of the end users it is considered that the soil screening values (SSVs) for residential with plant uptake should be employed.

Unless otherwise stated, potential sources of contamination include the following:

On site – artificial/made ground.

Off site – Unspecified works, factories or features; Road vehicle servicing and repair: garages and filling stations; Textile works and dye works; Railway land.

[11] This assessment has been based on the information as to the proposed development that has been provided by the client. If the plans should change, the assessment should be re-evaluated.

Table 4: *Potential Harm to Humans and Animals (fauna)*

SOURCES: ON-SITE AND OFF-SITE		
Pathways	**Receptor**	**Linkage Present?**
Direct contact/dermal absorption/soil ingestion	Operative	Yes – contact with soil likely during works.
	End User	Yes – site to be developed into residential housing with garden areas.
	Neighbours	Yes – possible source on site and populated residential area surrounds the site.
Inhalation of Dust/Vapours	Operative	Yes – contact with soil likely during works and vapours may accumulate in enclosed spaces.
	End User	Yes – source on and off site, residential end use and vapours may accumulate in enclosed spaces.
	Neighbours	Yes – residential properties located within 250m radius of the site and possible inhalation of dust during the works.
Ingestion of fruit/vegetables and/or waters	Operative	No – no edible plants or water sources in the area of the proposed new works.
	End User	Yes – site to be developed into residential housing with garden areas.
	Neighbours	Yes – possible source on site and densely populated residential area surrounds the site.
Migration of hazardous gases via permeable strata or shallow mining activity	Operative	Yes – possible source on and off site sources.
	End User	Yes – possible source on and off site sources.
	Neighbours	Yes – possible source on site source.

Table 5: *Potential Harm to Controlled Waters and Groundwater*

SOURCES: ON-SITE AND OFF-SITE		
Pathways	**Receptor**	**Linkage Present?**
Spillage/loss/run off direct to receiving water	Controlled Waters	Yes – possible source on site and controlled waters within 250m.
Migration via permeable unsaturated strata	Controlled Waters	Yes – possible source on site and secondary A aquifer beneath the site.
Run off via drainage/sewers etc	Controlled Waters	Yes – possible source on site, and in populated area with immediate neighbouring properties. .

Table 6: *Potential Harm to Plants (flora)*

SOURCES: ON-SITE AND OFF-SITE		
Pathways	**Receptor**	**Linkage Present?**
Direct contact with contaminated soils	Plants	Yes – site to be developed into residential housing with garden areas. Neighbouring properties with gardens and landscaping are present.
Uptake via root system	Plants	Yes – site to be developed into residential housing with garden areas. Neighbouring properties with gardens and landscaping are present.

Table 7: *Potential Harm to Buildings/Structures*

SOURCES: ON-SITE AND OFF-SITE		
Pathways	**Receptor**	**Linkage Present?**
Direct contact with contaminated soils	Building Materials	Yes – possible source on and off site and foundation and service installation materials may be affected by the site soil.
Direct contact with contaminated groundwater	Building Materials	Yes – possible source on and off site and foundation and service installation materials may be affected by the site soil.

3.2 Preliminary Risk Assessment

The preliminary risk assessment has been evaluated with reference to the following ratings and definitions:

Low - A pollution linkage is unlikely and/or the likelihood of harm occurring is low and of minor consequence.

Moderate - The linkage exists but further field or laboratory data is required to confirm that the contaminant has reached the receptor and the levels of contaminant are harmful.

High - The linkage exists and the available data indicates that significant harm may be caused and remedial action could be necessary.

Table 8: *Preliminary Risk Assessment*

SOURCES: ON-SITE AND OFF-SITE			
Pathways	**Receptor**	**Risk Rating**	**Notes**
Direct contact/dermal absorption/soil ingestion	Operative	Moderate	There are potential on and off site sources of contamination that may have caused contamination of the site. Any on site sources of contamination could migrate to neighbouring properties. Underlying geology is indicated to be of possible high permeability. Further testing required to reach a firm conclusion.
	End User		
	Neighbours		
Inhalation of Dust/Vapours	Operative	Moderate	There are potential on and off site sources of contamination that may have caused contamination of the site. Any on site sources of contamination could migrate to neighbouring properties. Construction activities may create dust on and off site, which, if contaminated, could adversely affect operatives, end users and neighbours. In the event that harmful vapours are present they may accumulate in enclosed spaces, affecting operatives, end users and neighbours. Further testing required to reach a firm conclusion
	End User		
	Neighbours		
Ingestion of fruit/vegetables and/or waters	End User	Moderate	There are potential on and off site sources of contamination that may have caused contamination of the site. Any on site sources of contamination could migrate to neighbouring properties. Underlying geology is indicated to be of possible high permeability. Further testing required to reach a firm conclusion.
	Neighbours		
Migration of hazardous gases via permeable strata	Operative	Moderate	Whilst there are no waste management activities listed within 250m of the site, it is possible that made ground associated with in-filled groundworkings is present on and off site. Gas monitoring is recommended to be undertaken during intrusive investigations.
	End User		
	Neighbours		
Spillage/loss/run off direct to receiving water	Controlled Waters	Moderate	There are potential on and off site sources of contamination that may have caused contamination of

Migration via permeable unsaturated strata	Controlled Waters		the site. Controlled waters within 250m. Underlying geology of possible high permeability and secondary A aquifer underlies the site. Further testing required to reach a firm conclusion
Run off via drainage/sewers etc	Controlled Waters		
Direct contact with contaminated soil	Plants	Moderate	There are potential on and off site sources of contamination that may have caused contamination of the site. Any on site sources of contamination could migrate to neighbouring properties. Underlying geology is indicated to be of possible high permeability. Further testing required to reach a firm conclusion.
Uptake via root system	Plants		
Direct contact with contaminated soils	Building Materials	Moderate	There are potential on and off site sources of contamination that may have caused contamination of the site. Underlying geology is indicated to be of possible high permeability. Further testing required to reach a firm conclusion.
Direct contact with contaminated groundwater	Building Materials		
Migration of mine gas via permeable strata	Operative	Low	Not in an area indicated to be affected by coal mining voids.
	End User		
Exposure to Radon	Operative	Low	Less than 1% of homes are above the action level for radon. BR211 states that radon protection measures are not necessary in the construction of new dwellings or extensions.
	End User		

4. INTRUSIVE INVESTIGATION

4.1 Site Investigation Philosophy

The information from the Phase 1 Desk Study shows there are potential sources of contamination on the site and in the surrounding area. In view of the above, any intrusive investigation should be undertaken in accordance with the sampling strategies given in BS10175: 2011 and CLR4:1994. These two sampling strategies may be classified as:

- Non Targeted – using a defined sampling pattern (BS10175)
- Targeted – based on prior knowledge and professional judgement (CLR4)

These sampling strategies are considered in more detail below. However, it is emphasised that they can be used individually or in combination depending on the depth of site knowledge.

Non Targeted Sampling.

If no obvious 'hot spots' of contamination have been identified on a site, it is recommended that a stratified random pattern of sampling points be considered. This work should be undertaken with reference to BS10175: 2011: *Investigation of potentially contaminated sites – Code of practice*: 7.6, and BS5930, *Code of practice for site investigations, as amended in 2007*.

Targeted Sampling.

If a possible 'hot spot' of contamination has been identified on a site, it is recommended that a herringbone pattern of sampling points be considered in the immediate vicinity. If strong evidence of contamination has then been identified, it is recommended that sampling be highly focused to reflect that evidence and the investigator's experience. This work should be undertaken with reference to CLR4, *Sampling Strategies for Contaminated Land, 1994*.

The density of sampling required is defined in BS10175: 2011: 7.7.2.2.3, which indicates that an *exploratory* investigation usually requires a lower density sample spacing than does a *main* investigation. The BS goes on to state that *the actual density should depend upon the confidence and robustness required of decisions that will be based on the information obtained. Thus the area and depth of interest will be related to the contaminants present, the pathways and the receptors. Typical densities of sampling grids can vary from 25m to 50m centres for exploratory investigations, and 10m to 25m centres for main investigations.*

4.2 Site Specific Investigation

In view of the information provided above it is considered that an investigation should include the following main elements.

- A regime of boreholes and trial pits should be undertaken to obtain geotechnical as well as environmental and chemical data. This could comprise the following:

  - Prior to borehole drilling commencing, it will be necessary to undertake some clearance of the site to gain access to some borehole locations. This may be undertaken with an excavator, and trialpits excavated across the site to establish an initial characterisation of the site. The trialpits may also be utilised for soakaway testing should drainage design require it.

  - A regime of boreholes using a rig capable of obtaining samples for profiling of made ground and samples of the underlying solid geology. Whilst this is likely to be achieved with a windowless sampling drilling rig,

it may be necessary to undertake deeper drilling in order to obtain rock cores and in order to establish the depth of any in-filled ground in the area of the old quarry (as identified by the historical maps).

- In total it is suggested that the investigation be treated in the first instance as an exploratory investigation, allowing for 18 borehole/trialpit locations.

- Installation of 9 No gas monitoring standpipes.

- It is considered that the chemical sampling strategy should based on BS 10175, Para 7.7.2.2.3 and that in the first instance an exploratory investigation be undertaken, to be supplemented with further testing should contamination test results suggest this to be necessary. Therefore, for this 4.51 hectare site a total of 18 sampling points would be required initially. Furthermore, the area indicated to have been affected by a historical oil spillage should be targeted by some of the test locations.

- Chemical testing should be undertaken on the above grid spacing and the following standard testing regime should be undertaken

  - **Metals** – Cd, Cr, Cu, Hg, Ni, Pb, Zn, V.
  - **Semi Metals and Non Metals** – As, Se, Free Cyanide and Phenols
  - **Hydrocarbons –** Polycyclic aromatic hydrocarbons (PAH's) 16 EPA, Total petroleum hydrocarbons (TPH CWG)
  - **Others** – pH, Organic Content.

  Should groundwater be encountered in the boreholes, the chemical testing regime may be required to include screening of water samples.

- Gas monitoring should be undertaken in accordance with Table 4.2 of CIRIA C665: 2007: *Assessing risks posed by hazardous ground gasses to buildings.* In that document guidance for the frequency of monitoring is provided on tables 5.5a and 5.5b *Typical/idealised frequency and period of monitoring* on page 60. For convenience, these tables have been combined and reproduced below.

Table 9: *Typical/idealised frequency and period of monitoring.*

Sensitivity of development	Generation potential of source				
	Very low	Low	Moderate	High	Very High
Low (commercial)	4/1	6/2	6/3	12/6	12/12
Moderate (flats)	6/2	6/3	9/6	12/12	24/24
High (residential + gardens)	6/3	9/6	12/6	24/12	24/24

Notes:

a) The first number is the minimum number of readings and the second number is the minimum period in months, for example 4/1 – Four sets of readings over 1 month.

b) At least two sets of readings must be at low and falling atmospheric pressure (but not restricted to periods below 1000mb) known as worst case conditions.

c) The frequency and period stated are considered to represent typical minimum requirements. Depending on specific circumstances fewer or additional readings may be required (e.g. any such variation subject to site specific justification). The NHBC guidance is also recommending these periods/frequencies of monitoring.

d) Historical data can be used as part of the data set.

e) Not all sites will require gas monitoring. However this would need to be confirmed with demonstrable evidence.

f) Placing high sensitivity end use on a high hazard site is not normally acceptable unless the source is removed or treated to reduce its gassing potential. Under such circumstances long-term monitoring may not be appropriate or required.

g) This guidance should be read in conjunction with BS 8576:2013 figure 6 which may justify fewer readings in the first instance, where the generation potential is considered to be very low to low. However, this should be undertaken pragmatically, and further readings obtained according to the above table, where a potentially significant source is identified and initial readings suggest that remedial measures are not necessary.

5. REFERENCES

- British Standards Institution (1999), BS5930: *Code of practice for site investigations*, B.S.I., London.
- British Standards Institution (2007), Amendment No 1 to BS5930: *Code of practice for site investigations*, B.S.I., London.
- British Standards Institution (2011), BS 10175: *Investigation of potentially contaminated sites – Code of Practice,* British Standards Institute.
- British Standards Institution (2013), BS 8576 Guidance on Investigations for Ground Gas – Permanent Gases and Volatile Organic Compounds.
- Department for Environment, Food and Rural Affairs and the Environment Agency, DEFRA R&D Publications, Environment Agency, Bristol.
  - CLR 2, 1994, *Guidance on preliminary site inspection of contaminated land*, Volume 1.
  - CLR 4, 1994, *Sampling Strategies for contaminated land*.

APPENDIX 1

ENVIROCHECK REPORTS

Envirocheck® Report:

Datasheet

Order Details:

Order Number:
61553197_1_1

Customer Reference:
J2958/14/EDS

National Grid Reference:
414870, 419250

Slice:
A

Site Area (Ha):
4.51

Search Buffer (m):
500

Site Details:

The School House
Ash Meadow Close
HUDDERSFIELD
HD2 1EX

Client Details:

Mr S Rogers
Rogers Geotechnical Services
Office 1 & 2
Barncliffe Business Park
Near Bank Shelley
Huddersfield
West Yorkshire
HB8 8LU

Contents

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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Peter Brett Associates Copyright Notice

Radon Potential dataset Copyright Notice

Report Version v49.0

Envirocheck®

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m (*up to 1000m)
Agency & Hydrological				
Contaminated Land Register Entries and Notices				
Discharge Consents	pg 1			50
Enforcement and Prohibition Notices				
Integrated Pollution Controls				
Integrated Pollution Prevention And Control				
Local Authority Integrated Pollution Prevention And Control				
Local Authority Pollution Prevention and Controls	pg 13		4	
Local Authority Pollution Prevention and Control Enforcements				
Nearest Surface Water Feature	pg 14		Yes	
Pollution Incidents to Controlled Waters	pg 14	1	5	7
Prosecutions Relating to Authorised Processes				
Prosecutions Relating to Controlled Waters				
Registered Radioactive Substances				
River Quality				
River Quality Biology Sampling Points				
River Quality Chemistry Sampling Points				
Substantiated Pollution Incident Register				
Water Abstractions	pg 16			(*2)
Water Industry Act Referrals				
Groundwater Vulnerability	pg 16	Yes	n/a	n/a
Bedrock Aquifer Designations	pg 16	Yes	n/a	n/a
Superficial Aquifer Designations			n/a	n/a
Source Protection Zones				
Extreme Flooding from Rivers or Sea without Defences	pg 17		Yes	n/a
Flooding from Rivers or Sea without Defences	pg 17		Yes	n/a
Areas Benefiting from Flood Defences				n/a
Flood Water Storage Areas				n/a
Flood Defences				n/a
Detailed River Network Lines	pg 17		Yes	Yes
Detailed River Network Offline Drainage				

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Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m (*up to 1000m)
Waste				
BGS Recorded Landfill Sites				
Historical Landfill Sites	pg 22			1
Integrated Pollution Control Registered Waste Sites				
Licensed Waste Management Facilities (Landfill Boundaries)				
Licensed Waste Management Facilities (Locations)	pg 22			1
Local Authority Recorded Landfill Sites				
Registered Landfill Sites	pg 22			1
Registered Waste Transfer Sites				
Registered Waste Treatment or Disposal Sites	pg 23			1
Hazardous Substances				
Control of Major Accident Hazards Sites (COMAH)				
Explosive Sites				
Notification of Installations Handling Hazardous Substances (NIHHS)				
Planning Hazardous Substance Consents				
Planning Hazardous Substance Enforcements				
Geological				
BGS 1:625,000 Solid Geology	pg 24	Yes	n/a	n/a
BGS Estimated Soil Chemistry	pg 24	Yes	Yes	Yes
BGS Recorded Mineral Sites	pg 31	1	2	5
BGS Urban Soil Chemistry				
BGS Urban Soil Chemistry Averages				
Brine Compensation Area			n/a	n/a
Coal Mining Affected Areas	pg 33	Yes	n/a	n/a
Mining Instability	pg 33	Yes	n/a	n/a
Man-Made Mining Cavities	pg 33			1
Natural Cavities				
Non Coal Mining Areas of Great Britain	pg 33	Yes	Yes	n/a
Potential for Collapsible Ground Stability Hazards	pg 33	Yes		n/a
Potential for Compressible Ground Stability Hazards	pg 33		Yes	n/a
Potential for Ground Dissolution Stability Hazards				n/a
Potential for Landslide Ground Stability Hazards	pg 34	Yes	Yes	n/a
Potential for Running Sand Ground Stability Hazards	pg 35		Yes	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 35	Yes	Yes	n/a
Radon Potential - Radon Affected Areas			n/a	n/a
Radon Potential - Radon Protection Measures			n/a	n/a

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Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m (*up to 1000m)
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Contemporary Trade Directory Entries	pg 37		7	5
Fuel Station Entries	pg 38		2	
Sensitive Land Use				
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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				
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	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: George Street, MILNSBRIDGE, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	307	2	414815 418825
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Pickford Street, MILNSBRIDGE, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	308	2	414810 418825
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Scar Lane, MILNSBRIDGE, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	309	2	414805 418825
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Scarbottom Mill, MILNSBRIDGE, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	310	2	414800 418825

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Factory Lane, MILNSBRIDGE, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	312	2	414815 418820
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Shaw Lane, MILNSBRIDGE, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	312	2	414795 418825
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Water Street, Lockwood, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	313	2	414810 418820
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Spring Mills, MILNSBRIDGE, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	313	2	414790 418825

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Animal By-Products Location: Dog Kennel Park, Moldgreen, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	313	2	414785 418825
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Longroyd Bridge, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	314	2	414805 418820
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Charley Browns, Longroyd Bridge, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	315	2	414800 418820
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Manchester Road, Longroyd Bridge, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	316	2	414795 418820

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Thistle Street, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	316	2	414815 418815
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Lockwood Sca, Lockwood, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	318	2	414810 418815
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Springdale Avenue, Longroyd Bridge, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	318	2	414790 418820
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Recreational & Cultural Location: Longley Golf Course, Moldgreen, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	318	2	414785 418820

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Carr Pit Road, Aspley, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	319	2	414805 418815
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Wakefield Road, Aspley, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	320	2	414800 418815
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Ark Hill, Birkby, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	321	2	414795 418815
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Station Road, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	321	2	414815 418810

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Beaumont Par, Lockwood, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	322	2	414810 418810
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Springdale Mill, Longroyd Bridge, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	323	2	414790 418815
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Chemical Manufacture/Storage Location: Bradley Chemical Works, Bradley Road, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	323	2	414785 418815
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: St Paul's Church, Armitage Road, HUDDERSFIELD Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	324	2	414805 418810

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Sewerage Network - Pumping Station - Water Company Location: Westhill Cso, Rotherham, . Authority: Environment Agency, North East Region Catchment Area: Calder Reference: S/Cb/51 Permit Version: 2 Effective Date: 2nd July 1993 Issued Date: 2nd July 1993 Revocation Date: 24th January 1995 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Varies With Outlet **Status: Revised by Notice, at direction of Secretary of State (Section 37(2))** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	325	2	414800 418810
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Sewerage Network - Pumping Station - Water Company Location: Westhill Cso, Rotherham, . Authority: Environment Agency, North East Region Catchment Area: Calder Reference: S/Cb/51 Permit Version: 1 Effective Date: 27th May 1963 Issued Date: 27th May 1963 Revocation Date: 1st July 1993 Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Varies With Outlet **Status: Transferred from Rivers (Prevention of Pollution) Act 1951-1961** Positional Accuracy: Located by supplier to within 10m	A8NW (S)	325	2	414800 418810
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Halifax Old Road, Birkby, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	326	2	414795 418810
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Off Queens Mill Road, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	326	2	414815 418805

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Gasworkd Street, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	327	2	414810 418805
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: St Thomas Road, Longroyd Bridge, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	327	2	414790 418810
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Anchor Street, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	328	2	414805 418805
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Chemical Manufacture/Storage Location: Bradley Chemical Works, Cooper Bridge, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	328	2	414785 418810

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Almondbury, Southfield Road, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	330	2	414800 418805
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Blackmoorfoot Road, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	331	2	414795 418805
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Whitehead Lane, Newsome, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	331	2	414815 418800
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Dewhirst Road, Fartown, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	332	2	414810 418800

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Nettleton Hill, Longwood, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	332	2	414790 418805
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Long Lane, Dalton, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	333	2	414805 418800
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Chemical Manufacture/Storage Location: Bradley Chemical Works, Leeds Road, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	333	2	414785 418805
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Daisy Street, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	334	2	414800 418800

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Colnebridge, Bog Green, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	336	2	414795 418800
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Newsome Road, Newsome, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	336	2	414815 418795
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Dale Street, Longwood, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	337	2	414790 418800
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Bent Street, Newsome, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	337	2	414810 418795

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Chemical Manufacture/Storage Location: Bradley Chemical Works, Bradley Road Number 2, HUDDERSFIELD Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	337	2	414785 418800
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Somerset Road, Moldgreen, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	338	2	414805 418795
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Manchester Road/Blackmoorfoot Road, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	339	2	414800 418795
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Lower Hirst, Longwood, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	341	2	414795 418795

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Not Given Location: Leymoor Road, Longwood, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	342	2	414790 418795
1	**Discharge Consents** Operator: Yorkshire Water Services Ltd Property Type: Chemical Manufacture/Storage Location: Bradley Chemical Works, Oak Road, HUDDERSFIELD, West Yorkshire Authority: Environment Agency, North East Region Catchment Area: Aire And Calder Navigation Reference: S/CB/51 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Storm /emergency overflow Discharge Environment: Freshwater Stream/River Receiving Water: Blackhouse Dike **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	342	2	414785 418795
2	**Local Authority Pollution Prevention and Controls** Name: Lexcast Ltd Location: The Old Courtyard, Ashbrow Mills, Ashbrow Road, Huddersfield, West Yorkshire, HD2 1DU Authority: Kirklees Metropolitan Borough Council, Environmental Health Department Permit Reference: PPC W 133 Dated: Not Supplied Process Type: Local Authority Pollution Prevention and Control Description: PG4/2 Processes for the manufacture of fibre reinforced plastics **Status: Permitted** Positional Accuracy: Automatically positioned to the address	A13NW (W)	84	3	414666 419298
3	**Local Authority Pollution Prevention and Controls** Name: Motosave Ltd Location: Bradford Road, Fartown, HUDDERSFIELD, HD2 2QN Authority: Kirklees Metropolitan Borough Council, Environmental Health Department Permit Reference: Ppc W 79 Dated: Not Supplied Process Type: Local Authority Air Pollution Control Description: PG1/1Waste oil burners, less than 0.4MW net rated thermal input **Status: Not Supplied** Positional Accuracy: Manually positioned to the road within the address or location	A13SW (SW)	167	3	414609 419072
4	**Local Authority Pollution Prevention and Controls** Name: Bridge Service Station Location: BRIDGE SERVICE STATION, 20 Bradford Road, HUDDERSFIELD, West Yorkshire, HD2 2LL Authority: Kirklees Metropolitan Borough Council, Environmental Health Department Permit Reference: PPC W 117 Dated: Not Supplied Process Type: Local Authority Pollution Prevention and Control Description: PG1/14 Petrol filling station **Status: Permitted** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	171	3	414605 419442
5	**Local Authority Pollution Prevention and Controls** Name: Asda Stores Ltd Location: Long Hill, Bradford Road, Huddersfield, West Yorkshire, HD2 2LQ Authority: Kirklees Metropolitan Borough Council, Environmental Health Department Permit Reference: PPC W 134 Dated: Not Supplied Process Type: Local Authority Pollution Prevention and Control Description: PG1/14 Petrol filling station **Status: Permitted** Positional Accuracy: Automatically positioned to the address	A13NW (N)	188	3	414818 419580

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Nearest Surface Water Feature	A13NW (NW)	27	-	414757 419421
6	**Pollution Incidents to Controlled Waters** Property Type: Oil Storage Depot Location: Huddersfield Road Authority: Environment Agency, North East Region Pollutant: Oils - Unknown Note: Not Supplied Incident Date: 23rd May 1989 Incident Reference: 9173 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A13SE (E)	0	2	415001 419201
7	**Pollution Incidents to Controlled Waters** Property Type: Industrial: Other Location: Ashbrow Mills, Red Doles Beck Authority: Environment Agency, North East Region Pollutant: Other Chemicals Note: Watercourse :Huddersfield Broad Canal (Sir John Ramsden Canal); From Millhouse Lane To River Calder At Cooper Bridge Incident Date: 17th March 1998 Incident Reference: SL980195 Catchment Area: Calder Tributaries Receiving Water: Freshwater Stream/River Cause of Incident: Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A13SW (W)	52	2	414700 419200
8	**Pollution Incidents to Controlled Waters** Property Type: Industrial: Other Location: Ashbrow Mills, Sheepridge , HUDDERSFIELD Authority: Environment Agency, North East Region Pollutant: Other Chemicals Note: River Colne; Fish Killed: No Information Incident Date: Not Supplied Incident Reference: SL981103 Catchment Area: Calder Tributaries Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Incident Severity: Category 1 - Major Incident Positional Accuracy: Located by supplier to within 100m	A13SW (W)	96	2	414650 419250
9	**Pollution Incidents to Controlled Waters** Property Type: Industrial Premises Location: Mouth/Todmorden Calder Afl Authority: Environment Agency, North East Region Pollutant: Chemicals - Other Organic Note: Not Supplied Incident Date: 19th August 1991 Incident Reference: 125391 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Incident Severity: Category 1 - Major Incident Positional Accuracy: Located by supplier to within 100m	A13NW (W)	148	2	414600 419295
9	**Pollution Incidents to Controlled Waters** Property Type: Industrial Premises Location: Todmorden/Source Calder Afu Authority: Environment Agency, North East Region Pollutant: Chemicals - Other Organic Note: Not Supplied Incident Date: 19th August 1991 Incident Reference: 125389 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Incident Severity: Category 1 - Major Incident Positional Accuracy: Located by supplier to within 100m	A13NW (W)	149	2	414600 419300

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
10	**Pollution Incidents to Controlled Waters** Property Type: Industrial: Other Location: Ashbrow Mills, Sheepridge , HUDDERSFIELD Authority: Environment Agency, North East Region Pollutant: Other Chemicals Note: River Colne; Fish Killed: No Information Incident Date: Not Supplied Incident Reference: SL981096 Catchment Area: Calder Tributaries Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A13NW (NW)	158	2	414650 419500
11	**Pollution Incidents to Controlled Waters** Property Type: Water Company Sewage: Sewage Treatment Works Location: Holme Af Authority: Environment Agency, North East Region Pollutant: Other Sewage Note: Fish Killed: No Information; Holme Incident Date: 27th September 1995 Incident Reference: SL950884 Catchment Area: Calder Tributaries Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A12SE (W)	265	2	414500 419100
12	**Pollution Incidents to Controlled Waters** Property Type: Industrial Premises Location: Mouth/Huddersfld Colne Afl Authority: Environment Agency, North East Region Pollutant: Kitchen Wastes (E.g. Peelings Etc.) Note: Not Supplied Incident Date: 4th October 1991 Incident Reference: 127046 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A8NW (SW)	287	2	414600 418900
13	**Pollution Incidents to Controlled Waters** Property Type: Other General Premises Location: Calder Afl Authority: Environment Agency, North East Region Pollutant: Other Sewage Note: Fish Killed: No Information Incident Date: 28th August 1995 Incident Reference: SL950848 Catchment Area: Calder Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A12NE (NW)	289	2	414500 419500
14	**Pollution Incidents to Controlled Waters** Property Type: Other General Premises Location: The Grove, Dewhirst Road Authority: Environment Agency, North East Region Pollutant: Rubbish Note: Pollution Found; Fish Killed: No Information Incident Date: 23rd August 1996 Incident Reference: SL960959 Catchment Area: Calder Tributaries Receiving Water: Freshwater Stream/River Cause of Incident: Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A8NW (S)	343	2	414700 418800
15	**Pollution Incidents to Controlled Waters** Property Type: Construction/Demolition Location: Battyeford Bridge, /Rastrick Bridge Calder 05C Authority: Environment Agency, North East Region Pollutant: Mud/Clay/Soil Note: Not Supplied Incident Date: 7th August 1994 Incident Reference: 152818 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A7NE (SW)	354	2	414500 418900

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
16	**Pollution Incidents to Controlled Waters** Property Type: Industrial Premises Location: Mouth/Todmorden Calder Afl Authority: Environment Agency, North East Region Pollutant: Miscellaneous - Vehicle Washings And De Waxing Note: Not Supplied Incident Date: 12th March 1991 Incident Reference: 120424 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A8NW (SW)	374	2	414600 418800
17	**Pollution Incidents to Controlled Waters** Property Type: Water Company Sewage: Foul Sewer Location: Mouth/Huddersfld Colne Afl Authority: Environment Agency, North East Region Pollutant: Unknown Sewage Note: Not Supplied Incident Date: 16th March 1993 Incident Reference: 141453 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A18SW (N)	408	2	414700 419800
	Water Abstractions Operator: H Charlesworth & Company Limited Licence Number: 2/27/11/015 Permit Version: Not Supplied Location: Location Description Not Available Authority: Environment Agency, North East Region Abstraction: General Industrial Abstraction Type: Not Supplied Source: Groundwater Daily Rate (m3): 132 Yearly Rate (m3): 36368 Details: Coal Measures Licence Revoked Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A14NE (E)	685	2	415700 419400
	Water Abstractions Operator: British Waterways Board Licence Number: 2/27/11/139 Permit Version: Not Supplied Location: Location Description Not Available Authority: Environment Agency, North East Region Abstraction: Cooling Abstraction Type: Not Supplied Source: Surface Daily Rate (m3): 0 Yearly Rate (m3): 90920 Details: Licence Revoked Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A9SW (SE)	828	2	415300 418400
	Groundwater Vulnerability 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 Map Sheet: Sheet 11 South Pennines Scale: 1:100,000	A13SW (S)	0	2	414866 419246
	Drift Deposits None				
	Bedrock Aquifer Designations Aquifer Designation: Secondary Aquifer - A	A13SW (S)	0	4	414866 419246
	Bedrock Aquifer Designations Aquifer Designation: Secondary Aquifer - A	A13SE (E)	0	4	415000 419246
	Superficial Aquifer Designations No Data Available				

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A8NW (S)	223	2	414759 418913
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A8NW (S)	223	2	414758 418914
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A8NW (S)	224	2	414759 418913
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A8NW (S)	227	2	414751 418910
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A8NW (S)	233	2	414764 418904
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A8NW (S)	223	2	414758 418914
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				
18	**Detailed River Network Lines** River Type: Tertiary River River Name: Not Supplied Hydrographic Area: D004 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A13NW (NW)	30	2	414741 419407
19	**Detailed River Network Lines** River Type: Extended Culvert (greater than 50m) River Name: Not Supplied Hydrographic Area: D004 River Flow Type: Primary Flow Path River Surface Level: Below Surface Drain Feature: Not a Drain Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A13NW (NW)	31	2	414702 419337
20	**Detailed River Network Lines** River Type: Extended Culvert (greater than 50m) River Name: Not Supplied Hydrographic Area: D004 River Flow Type: Primary Flow Path River Surface Level: Below Surface Drain Feature: Not a Drain Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A13SW (W)	52	2	414693 419211

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
21	**Detailed River Network Lines** River Type: Secondary River River Name: Not Supplied Hydrographic Area: D004 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Other Rivers Management Status: Water Course Name: Not Supplied Water Course Reference: Not Supplied	A13NW (W)	66	2	414681 419273
22	**Detailed River Network Lines** River Type: Extended Culvert (greater than 50m) River Name: Not Supplied Hydrographic Area: D004 River Flow Type: Primary Flow Path River Surface Level: Below Surface Drain Feature: Not a Drain Flood Risk Other Rivers Management Status: Water Course Name: Not Supplied Water Course Reference: Not Supplied	A13NW (W)	76	2	414672 419282
23	**Detailed River Network Lines** River Type: Tertiary River River Name: Not Supplied Hydrographic Area: D004 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Other Rivers Management Status: Water Course Name: Not Supplied Water Course Reference: Not Supplied	A13NW (NW)	166	2	414599 419396
24	**Detailed River Network Lines** River Type: Secondary River River Name: Not Supplied Hydrographic Area: D004 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Other Rivers Management Status: Water Course Name: Not Supplied Water Course Reference: Not Supplied	A8NW (S)	223	2	414754 418914
25	**Detailed River Network Lines** River Type: Tertiary River River Name: Not Supplied Hydrographic Area: D004 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Other Rivers Management Status: Water Course Name: Not Supplied Water Course Reference: Not Supplied	A8NW (S)	231	2	414759 418906
26	**Detailed River Network Lines** River Type: Secondary River River Name: Blackhouse Dike Hydrographic Area: D004 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Other Rivers Management Status: Water Course Name: Not Supplied Water Course Reference: Not Supplied	A8NW (S)	276	2	414775 418861

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
27	**Detailed River Network Lines** River Type: Secondary River River Name: Blackhouse Dike Hydrographic Area: D004 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Management Status: Flood Risk Management Indicative/Statutory Main River Water Course Name: Blackhouse Dike Water Course Reference: 3429	A8NW (S)	303	2	414822 418827
28	**Detailed River Network Lines** River Type: Secondary River River Name: Allison Hydrographic Area: D004 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Management Status: Flood Risk Management Indicative/Statutory Main River Water Course Name: Allison Dike Water Course Reference: 3428	A8NW (S)	312	2	414797 418825
29	**Detailed River Network Lines** River Type: Secondary River River Name: Allison Dike Hydrographic Area: D004 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Management Status: Flood Risk Management Indicative/Statutory Main River Water Course Name: Allison Dike Water Course Reference: 3428	A12SE (SW)	329	2	414476 418975
30	**Detailed River Network Lines** River Type: Secondary River River Name: Not Supplied Hydrographic Area: D004 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Management Status: Flood Risk Management Indicative/Statutory Main River Water Course Name: Allison Dike Water Course Reference: 3428	A8NW (SW)	335	2	414596 418846
31	**Detailed River Network Lines** River Type: Extended Culvert (greater than 50m) River Name: Allison Hydrographic Area: D004 River Flow Type: Primary Flow Path River Surface Level: Below Surface Drain Feature: Not a Drain Flood Risk Management Status: Flood Risk Management Indicative/Statutory Main River Water Course Name: Allison Dike Water Course Reference: 3428	A8NW (SW)	335	2	414596 418846
32	**Detailed River Network Lines** River Type: Extended Culvert (greater than 50m) River Name: Not Supplied Hydrographic Area: D004 River Flow Type: Primary Flow Path River Surface Level: Below Surface Drain Feature: Not a Drain Flood Risk Management Status: Flood Risk Management Indicative/Statutory Main River Water Course Name: Blackhouse Dike Water Course Reference: 3429	A8NW (S)	337	2	414856 418789

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
33	**Detailed River Network Lines** River Type: Extended Culvert (greater than 50m) River Name: Allison Hydrographic Area: D004 River Flow Type: Primary Flow Path River Surface Level: Below Surface Drain Feature: Not a Drain Flood Risk Other Rivers Management Status: Water Course Name: Not Supplied Water Course Reference: Not Supplied	A12SE (SW)	342	2	414441 419021
34	**Detailed River Network Lines** River Type: Tertiary River River Name: Allison Hydrographic Area: D004 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Flood Risk Management Indicative/Statutory Main River Management Status: Water Course Name: Allison Dike Water Course Reference: 3428	A12SE (SW)	342	2	414441 419021
35	**Detailed River Network Lines** River Type: Secondary River River Name: Drain Hydrographic Area: D004 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Drain (ditch, Reen, Rhyne, Drain) Flood Risk Other Rivers Management Status: Water Course Name: Not Supplied Water Course Reference: Not Supplied	A12SE (SW)	359	2	414439 418981
36	**Detailed River Network Lines** River Type: Tertiary River River Name: Drain Hydrographic Area: D004 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Drain (ditch, Reen, Rhyne, Drain) Flood Risk Other Rivers Management Status: Water Course Name: Not Supplied Water Course Reference: Not Supplied	A12SE (SW)	360	2	414438 418981
37	**Detailed River Network Lines** River Type: Extended Culvert (greater than 50m) River Name: Not Supplied Hydrographic Area: D004 River Flow Type: Primary Flow Path River Surface Level: Below Surface Drain Feature: Not a Drain Flood Risk Other Rivers Management Status: Water Course Name: Not Supplied Water Course Reference: Not Supplied	A7NE (SW)	361	2	414507 418882
38	**Detailed River Network Lines** River Type: Tertiary River River Name: Not Supplied Hydrographic Area: D004 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Other Rivers Management Status: Water Course Name: Not Supplied Water Course Reference: Not Supplied	A7NE (SW)	478	2	414379 418851

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
39	**Detailed River Network Lines** River Type: Secondary River River Name: Blackhouse Dike Hydrographic Area: D004 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Management Status: Flood Risk Management Indicative/Statutory Main River Water Course Name: Blackhouse Dike Water Course Reference: 3429	A8NE (S)	498	2	414988 418636
	Detailed River Network Offline Drainage None				

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
40	**Historical Landfill Sites** Licence Holder: Kirklees Metropolitan Borough Council Location: Bradford Road, Huddersfield Name: Brackenhall Dam Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD04175 First Input Date: 31st December 1984 Last Input Date: 31st December 1986 Specified Waste Type: Deposited Waste included Inert and Commercial Waste EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: 4700/0793 BGS Ref: Not Supplied Other Ref: 4700/0455	A18SW (N)	264	2	414754 419664
41	**Licensed Waste Management Facilities (Locations)** Licence Number: 61046 Location: Netheroyd Hill Road, Fixby, Huddersfield, West Yorkshire, HD2 2LX Operator Name: Kirklees Highways Services Operator Location: Not Supplied Authority: Environment Agency - North East Region, Yorkshire Area Site Category: Transfer Stations Taking Non-biodegradable Wastes **Licence Status: Surrendered** Issued: 4th January 1994 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: 1st December 2010 IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A12SE (W)	444	2	414302 419254
	Local Authority Landfill Coverage Name: Kirklees Metropolitan Borough Council - Has not been able to supply Landfill data		0	10	414866 419246
42	**Registered Landfill Sites** Licence Holder: Kirklees M.D.C. Licence Reference: 455 Site Location: Brackenhall Dam, Bradford Road, Huddersfield, West Yorkshire Licence Easting: 414740 Licence Northing: 419750 Operator Location: PO Box 95, Civic Centre, HUDDERSFIELD, West Yorkshire, HD1 2NA Authority: Environment Agency - North East Region, Ridings Area Site Category: Landfill Max Input Rate: Undefined Waste Source Restrictions: No known restriction on source of waste Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 1st August 1984 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Construction And Demolition Wastes Excavated Natural Materials $ Prohibited Waste: Liable To Cause Enviromental Hazards Poisonous, Noxious, Polluting Wastes	A18SW (N)	353	2	414740 419750

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
43	**Registered Waste Treatment or Disposal Sites** Licence Holder: Kirklees Highways Services Licence Reference: 1432 Site Location: Netherroyd Hill Storage Site, Fixby, Huddersfield, West Yorkshire Operator Location: Oldgate House, 2 Oldgate, Huddersfield, West Yorkshire Authority: Environment Agency - North East Region, Ridings Area Site Category: Transfer - with treatment Max Input Rate: Small (Equal to or greater than 10,000 and less than 25,000 tonnes per year) Waste Source Restrictions: Waste produced/controlled by licence holder Licence Status: Site not yet started Dated: 1st January 1994 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Located by supplier to within 100m Boundary Quality: Not Supplied Authorised Waste: Construction And Demolition Wastes Max.Waste Permitted By Licence Prohibited Waste: Liable To Cause Environmental Hazards Other Putrescible Material Paper/Cardboard Waste Poisonous, Noxious, Polluting Wastes Spec.Waste (Epa'90:S62/1996 Regs) Waste N.O.S. Wood	A12SE (W)	446	2	414300 419250

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Lower Westphalian (mainly Productive Coal Measures)	A13SW (S)	0	4	414866 419246
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: >180mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A13SW (S)	0	5	414852 419204
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13SE (E)	0	5	415000 419197
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13SW (S)	0	5	414866 419246
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A13SE (E)	0	5	415000 419246
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: >180mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A13NE (NE)	14	5	414922 419324
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13NE (E)	31	5	415000 419273

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: >180mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A13SW (S)	31	5	414874 419093
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13SE (SE)	37	5	415012 419139
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A13SE (SE)	46	5	415000 419132
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13SE (SE)	47	5	414986 419124
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: >180mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A13SE (SE)	48	5	414963 419108
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13SW (W)	68	5	414671 419229

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13SE (SE)	70	5	415000 419106
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13SW (S)	105	5	414874 419019
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13NE (NE)	115	5	414949 419440
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A13SW (S)	124	5	414866 419000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: >180mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A13SW (S)	137	5	414810 419000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A13SE (SE)	139	5	415000 419024

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A13NE (NE)	141	5	415000 419416
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: >180mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A13SW (S)	152	5	414794 418988
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A13SE (SE)	159	5	415000 419000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13NW (NW)	162	5	414654 419511
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A13SW (SW)	191	5	414629 419000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A14SW (E)	232	5	415271 419160

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A14NW (E)	235	5	415249 419319
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A8NE (SE)	255	5	415017 418900
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: >180mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A18SW (N)	262	5	414871 419658
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A18SW (N)	263	5	414728 419661
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A18SW (N)	275	5	414694 419662
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A8NW (S)	279	5	414790 418858

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A8NE (SE)	299	5	415035 418859
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: >180mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A8NE (S)	299	5	415000 418844
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A13SE (SE)	322	5	415230 418944
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A18SE (N)	335	5	415000 419656
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A8NW (S)	336	5	414850 418790
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: >180mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A12NE (NW)	339	5	414465 419544

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14SW (SE)	340	5	415285 418967
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: >180mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A12NE (W)	341	5	414414 419419
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: >180mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A17SE (NW)	345	5	414548 419662
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A17SE (NW)	373	5	414507 419662
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14SW (SE)	379	5	415362 419000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A7NE (SW)	388	5	414537 418821

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A8NE (S)	400	5	415000 418738
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: >180mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A8NW (S)	441	5	414765 418690
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A12NE (W)	456	5	414317 419466
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: >180mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A8NW (SW)	485	5	414586 418685
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 30 - 45 mg/kg	A14SW (E)	488	5	415510 419063
44	**BGS Recorded Mineral Sites** Site Name: Cuckolds Clough Quarries Location: Ash Brow Road, Netheroyd Hill, Huddersfield, West Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 91245 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Unknown Operator Periodic Type: Carboniferous Geology: Elland Flags Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A13SW (SW)	0	4	414771 419162

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
45	**BGS Recorded Mineral Sites** Site Name: Cuckolds Clough Quarries Location: Ash Brow Road, Netheroyd Hill, Huddersfield, West Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 91246 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Unknown Operator Periodic Type: Carboniferous Geology: Elland Flags Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A13SW (W)	8	4	414743 419225
46	**BGS Recorded Mineral Sites** Site Name: Ash Brow Location: , Netheroyd Hill, Huddersfield, West Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 91243 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Unknown Operator Periodic Type: Carboniferous Geology: Elland Flags Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A13NW (W)	179	4	414569 419298
47	**BGS Recorded Mineral Sites** Site Name: Woodside Mine Location: , Netheroyd Hill, Huddersfield, West Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 165441 Type: Opencast **Status: Ceased** Operator: William Aspinall Operator Location: William Aspinall, Fartown, Huddersfield, West Yorkshire Periodic Type: Carboniferous Geology: Elland Flags Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A18SW (NW)	296	4	414617 419651
47	**BGS Recorded Mineral Sites** Site Name: Woodside Mine Location: , Netheroyd Hill, Huddersfield, West Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 165442 Type: Opencast **Status: Ceased** Operator: William Aspinall Operator Location: William Aspinall, Fartown, Huddersfield, West Yorkshire Periodic Type: Carboniferous Geology: Elland Flags Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A18SW (NW)	299	4	414651 419672
48	**BGS Recorded Mineral Sites** Site Name: Netheroyd Hill Location: , Netheroyd Hill, Huddersfield, West Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 91210 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Unknown Operator Periodic Type: Carboniferous Geology: Elland Flags Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A17SE (NW)	332	4	414515 419610
49	**BGS Recorded Mineral Sites** Site Name: Netheroyd Hill Location: , Netheroyd Hill, Huddersfield, West Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 91211 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Unknown Operator Periodic Type: Carboniferous Geology: Elland Flags Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A12NE (NW)	408	4	414407 419584

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
50	**BGS Recorded Mineral Sites** Site Name: Gamble Brow Location: , Netheroyd Hill, Huddersfield, West Yorkshire Source: British Geological Survey, National Geoscience Information Service Reference: 91242 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Unknown Operator Periodic Type: Carboniferous Geology: Elland Flags Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A12NE (W)	438	4	414310 419300
	BGS Measured Urban Soil Chemistry No data available				
	BGS Urban Soil Chemistry Averages No data available				
	Coal Mining Affected Areas Description: In an area which may be affected by coal mining activity. It is recommended that a coal mining report is obtained from the Coal Authority. Contact details are included in the Useful Contacts section of this report.	A13SW (S)	0	6	414866 419246
	Mining Instability Mining Evidence: Inconclusive Coal Mining Source: Ove Arup & Partners Boundary Quality: As Supplied	A13SE (E)	0	-	415000 419246
	Mining Instability Mining Evidence: Inconclusive Coal Mining Source: Ove Arup & Partners Boundary Quality: As Supplied	A13SW (S)	0	-	414866 419246
	Mining Instability Mining Evidence: Conclusive Rock Mining Source: Ove Arup & Partners Boundary Quality: As Supplied	A13SW (S)	0	-	414866 419246
	Man-Made Mining Cavities Easting: 414600 Northing: 419600 Distance: 264 Quadrant Reference: A18 Quadrant Reference: SW Bearing Ref: NW Cavity Type: Elland Flagstone Mine-Details Unknown Commodity: Flagstones Solid Geology Detail: Lower Coal Measures Superficial Geology Detail: No Details	A18SW (NW)	264	7	414600 419600
	Non Coal Mining Areas of Great Britain Risk: Likely Source: British Geological Survey, National Geoscience Information Service	A13SE (E)	0	4	415000 419246
	Non Coal Mining Areas of Great Britain Risk: Likely Source: British Geological Survey, National Geoscience Information Service	A13SW (S)	0	4	414866 419246
	Non Coal Mining Areas of Great Britain Risk: Likely Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	70	4	415000 419106
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (S)	0	4	414866 419246
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (E)	0	4	415000 419246
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (S)	0	4	414866 419246
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (E)	0	4	415000 419246

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Potential for Compressible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	54	4	414725 419099
	Potential for Compressible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	61	4	414772 419459
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (S)	0	4	414866 419246
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (E)	0	4	415000 419246
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SW (W)	0	4	414791 419255
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (S)	0	4	414866 419246
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (E)	0	4	415000 419246
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SW (S)	0	4	414865 419200
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SE (E)	0	4	415000 419197
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NW (N)	17	4	414868 419376
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SW (S)	31	4	414874 419093
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	36	4	414735 419404
	Potential for Landslide Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13SW (S)	42	4	414834 419091
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SW (W)	49	4	414697 419246
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	58	4	414942 419082
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	70	4	415000 419106
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SW (S)	84	4	414840 419051
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	88	4	414739 419480
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NW (W)	110	4	414637 419276
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	119	4	414660 419442
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	123	4	415007 419381

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	134	4	415124 419098
	Potential for Landslide Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13SW (W)	136	4	414612 419226
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	139	4	415000 419024
	Potential for Landslide Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	140	4	414648 419466
	Potential for Landslide Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	149	4	414630 419449
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	154	4	414691 419000
	Potential for Landslide Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	160	4	414697 418991
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SW (S)	181	4	414779 418956
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	189	4	414615 419505
	Potential for Landslide Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A12NE (W)	192	4	414556 419290
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A12NE (W)	195	4	414552 419284
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A18SW (N)	218	4	414863 419600
	Potential for Landslide Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A12NE (NW)	224	4	414542 419405
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (S)	0	4	414866 419246
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (E)	0	4	415000 419246
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	54	4	414725 419099
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	61	4	414772 419459
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (S)	0	4	414852 419204
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (E)	0	4	415000 419197
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (S)	0	4	414866 419246
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (E)	0	4	415000 419246

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	14	4	414922 419324
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (S)	31	4	414874 419093
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (E)	31	4	415000 419273
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (W)	58	4	414671 419229
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (S)	105	4	414874 419019
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	115	4	414949 419440
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (N)	126	4	414805 419520
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	139	4	415000 419024
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	141	4	415000 419416
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A14SW (E)	232	4	415271 419160
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13SW (S)	0	4	414866 419246
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13SE (E)	0	4	415000 419246
	Radon Potential - Radon Affected Areas Affected Area: The property is in a lower probability radon area, as less than 1% of homes are above the action level Source: British Geological Survey, National Geoscience Information Service	A13SW (S)	0	4	414866 419246
	Radon Potential - Radon Affected Areas Affected Area: The property is in a lower probability radon area, as less than 1% of homes are above the action level Source: British Geological Survey, National Geoscience Information Service	A13SE (E)	0	4	415000 419246

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
51	**Contemporary Trade Directory Entries** Name: Lexcast Ltd Location: The Old Courtyard, Ashbrow Mills, Ashbrow Road, Huddersfield, HD2 1DU Classification: Plastic Products - Manufacturers **Status: Active** Positional Accuracy: Automatically positioned to the address	A13NW (W)	84	-	414666 419298
52	**Contemporary Trade Directory Entries** Name: Ashbrow Garage Ltd Location: Ashbrow Road, Huddersfield, West Yorkshire, HD2 1DU Classification: Garage Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SW (SW)	90	-	414686 419090
53	**Contemporary Trade Directory Entries** Name: Clegg Wools Ltd Location: Ashbrow Mills, Ashbrow Road, Huddersfield, HD2 1DU Classification: Textile Manufacturing **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (SW)	109	-	414649 419145
54	**Contemporary Trade Directory Entries** Name: Time Revolution Location: 409, Bradford Road, Huddersfield, HD2 2RB Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (SW)	184	-	414602 419048
54	**Contemporary Trade Directory Entries** Name: Hilks Catering Equipment Location: 405, Bradford Road, Huddersfield, HD2 2RB Classification: Catering Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (SW)	187	-	414604 419037
55	**Contemporary Trade Directory Entries** Name: Courtney Home & Office Services Location: Farwood Lodge, 392, Bradford Road, Huddersfield, West Yorkshire, HD2 2QZ Classification: Cleaning Services - Commercial **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A13SW (SW)	193	-	414715 418950
56	**Contemporary Trade Directory Entries** Name: Motosave Location: Bradford Road, Huddersfield, HD2 2QN Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (SW)	227	-	414669 418930
57	**Contemporary Trade Directory Entries** Name: Lee Motor Co Location: Carefill House, 1, York Avenue, Huddersfield, HD2 2QR Classification: Car Dealers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8NW (SW)	365	-	414592 418814
58	**Contemporary Trade Directory Entries** Name: Power Clean Location: Fulford Av, Huddersfield, West Yorkshire, HD2 2QS Classification: Carpet, Curtain & Upholstery Cleaners **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A7NE (SW)	371	-	414479 418897
59	**Contemporary Trade Directory Entries** Name: Hi Q Tyre Location: York Avenue, Huddersfield, HD2 2QR Classification: Tyre Dealers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	392	-	414538 418816
59	**Contemporary Trade Directory Entries** Name: P & A Motors Location: York Avenue, Huddersfield, HD2 2QR Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	392	-	414538 418816
60	**Contemporary Trade Directory Entries** Name: Qualtec Control Ltd Location: Brackenhall Works,Bradford Rd, Huddersfield, West Yorkshire, HD2 2YH Classification: Valve Manufacturers & Suppliers **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A8NW (SW)	420	-	414620 418742

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
61	**Fuel Station Entries** Name: Netherfield Service Station Location: Bradford Road, Metheroyd Hill, HUDDERSFIELD, West Yorkshire, HD2 2RB Brand: Obsolete Premises Type: Not Applicable **Status: Obsolete** Positional Accuracy: Approximate location provided by supplier	A13SW (W)	78	-	414672 419225
62	**Fuel Station Entries** Name: Asda Huddersfield Location: Bradford Road, Brackenhall, Huddersfield, West Yorkshire, HD2 2LQ Brand: ASDA Premises Type: Hypermarket **Status: Open** Positional Accuracy: Manually positioned to the address or location	A13NW (N)	193	-	414742 419589

Agency & Hydrological	Version	Update Cycle
Contaminated Land Register Entries and Notices		
Kirklees Metropolitan Borough Council - Planning Services	November 2013	Annual Rolling Update
Calderdale Metropolitan Borough Council - Environmental Health	September 2014	Annual Rolling Update
Discharge Consents		
Environment Agency - North East Region	August 2014	Quarterly
Enforcement and Prohibition Notices		
Environment Agency - North East Region	March 2013	As notified
Integrated Pollution Controls		
Environment Agency - North East Region	October 2008	Not Applicable
Integrated Pollution Prevention And Control		
Environment Agency - North East Region	August 2014	Quarterly
Local Authority Integrated Pollution Prevention And Control		
Kirklees Metropolitan Borough Council - Environmental Health Department	April 2014	Annual Rolling Update
Calderdale Metropolitan Borough Council - Environmental Health	October 2014	Annual Rolling Update
Local Authority Pollution Prevention and Controls		
Kirklees Metropolitan Borough Council - Environmental Health Department	April 2014	Annual Rolling Update
Calderdale Metropolitan Borough Council - Environmental Health	February 2013	Annual Rolling Update
Local Authority Pollution Prevention and Control Enforcements		
Kirklees Metropolitan Borough Council - Environmental Health Department	April 2014	Annual Rolling Update
Calderdale Metropolitan Borough Council - Environmental Health	October 2014	Annual Rolling Update
Nearest Surface Water Feature		
Ordnance Survey	July 2012	Quarterly
Pollution Incidents to Controlled Waters		
Environment Agency - North East Region	December 1998	Not Applicable
Prosecutions Relating to Authorised Processes		
Environment Agency - North East Region	March 2013	As notified
Prosecutions Relating to Controlled Waters		
Environment Agency - North East Region	March 2013	As notified
Registered Radioactive Substances		
Environment Agency - North East Region	August 2014	Quarterly
River Quality		
Environment Agency - Head Office	November 2001	Not Applicable
River Quality Biology Sampling Points		
Environment Agency - Head Office	July 2012	Annually
River Quality Chemistry Sampling Points		
Environment Agency - Head Office	July 2012	Annually
Substantiated Pollution Incident Register		
Environment Agency - North East Region - Ridings Area	August 2014	Quarterly
Environment Agency - North East Region - Yorkshire Area	August 2014	Quarterly
Water Abstractions		
Environment Agency - North East Region	July 2014	Quarterly
Water Industry Act Referrals		
Environment Agency - North East Region	August 2014	Quarterly
Groundwater Vulnerability		
Environment Agency - Head Office	January 2011	Not Applicable
Drift Deposits		
Environment Agency - Head Office	January 1999	Not Applicable
Bedrock Aquifer Designations		
British Geological Survey - National Geoscience Information Service	October 2012	Annually
Superficial Aquifer Designations		
British Geological Survey - National Geoscience Information Service	October 2012	Annually

Agency & Hydrological	Version	Update Cycle
Source Protection Zones		
Environment Agency - Head Office	August 2014	Quarterly
Extreme Flooding from Rivers or Sea without Defences		
Environment Agency - Head Office	August 2014	Quarterly
Flooding from Rivers or Sea without Defences		
Environment Agency - Head Office	August 2014	Quarterly
Areas Benefiting from Flood Defences		
Environment Agency - Head Office	August 2014	Quarterly
Flood Water Storage Areas		
Environment Agency - Head Office	August 2014	Quarterly
Flood Defences		
Environment Agency - Head Office	August 2014	Quarterly
Detailed River Network Lines		
Environment Agency - Head Office	March 2012	Annually
Detailed River Network Offline Drainage		
Environment Agency - Head Office	March 2012	Annually
Waste	**Version**	**Update Cycle**
BGS Recorded Landfill Sites		
British Geological Survey - National Geoscience Information Service	June 1996	Not Applicable
Historical Landfill Sites		
Environment Agency - North East Region - Ridings Area	May 2014	Quarterly
Environment Agency - North East Region - Yorkshire Area	May 2014	Quarterly
Integrated Pollution Control Registered Waste Sites		
Environment Agency - North East Region	October 2008	Not Applicable
Licensed Waste Management Facilities (Landfill Boundaries)		
Environment Agency - North East Region - Ridings Area	August 2014	Quarterly
Environment Agency - North East Region - Yorkshire Area	August 2014	Quarterly
Licensed Waste Management Facilities (Locations)		
Environment Agency - North East Region - Ridings Area	August 2014	Quarterly
Environment Agency - North East Region - Yorkshire Area	August 2014	Quarterly
Local Authority Landfill Coverage		
Calderdale Metropolitan Borough Council - Environmental Health	May 2000	Not Applicable
Kirklees Metropolitan Borough Council - Planning Services	May 2000	Not Applicable
Local Authority Recorded Landfill Sites		
Calderdale Metropolitan Borough Council - Environmental Health	May 2000	Not Applicable
Kirklees Metropolitan Borough Council - Planning Services	May 2000	Not Applicable
Registered Landfill Sites		
Environment Agency - North East Region - Ridings Area	March 2003	Not Applicable
Registered Waste Transfer Sites		
Environment Agency - North East Region - Ridings Area	March 2003	Not Applicable
Registered Waste Treatment or Disposal Sites		
Environment Agency - North East Region - Ridings Area	March 2003	Not Applicable

Hazardous Substances	Version	Update Cycle
Control of Major Accident Hazards Sites (COMAH) Health and Safety Executive	August 2014	Bi-Annually
Explosive Sites Health and Safety Executive	October 2014	Bi-Annually
Notification of Installations Handling Hazardous Substances (NIHHS) Health and Safety Executive	November 2000	Not Applicable
Planning Hazardous Substance Enforcements Kirklees Metropolitan Borough Council - Planning Services Calderdale Metropolitan Borough Council	October 2014 September 2013	Annual Rolling Update Annual Rolling Update
Planning Hazardous Substance Consents Kirklees Metropolitan Borough Council - Planning Services Calderdale Metropolitan Borough Council	October 2014 September 2013	Annual Rolling Update Annual Rolling Update
Geological	**Version**	**Update Cycle**
BGS 1:625,000 Solid Geology British Geological Survey - National Geoscience Information Service	August 1996	Not Applicable
BGS Estimated Soil Chemistry British Geological Survey - National Geoscience Information Service	January 2010	Annually
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	October 2014	Bi-Annually
Brine Compensation Area Cheshire Brine Subsidence Compensation Board	August 2011	Not Applicable
Coal Mining Affected Areas The Coal Authority - Mining Report Service	December 2013	As notified
Mining Instability Ove Arup & Partners	October 2000	Not Applicable
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	July 2014	Not Applicable
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2014	Annually
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2014	Annually
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	June 2014	Annually
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2014	Annually
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2014	Annually
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2014	Annually
Radon Potential - Radon Affected Areas British Geological Survey - National Geoscience Information Service	July 2011	Annually
Radon Potential - Radon Protection Measures British Geological Survey - National Geoscience Information Service	July 2011	Annually
Industrial Land Use	**Version**	**Update Cycle**
Contemporary Trade Directory Entries Thomson Directories	August 2014	Quarterly
Fuel Station Entries Catalist Ltd - Experian	August 2014	Quarterly

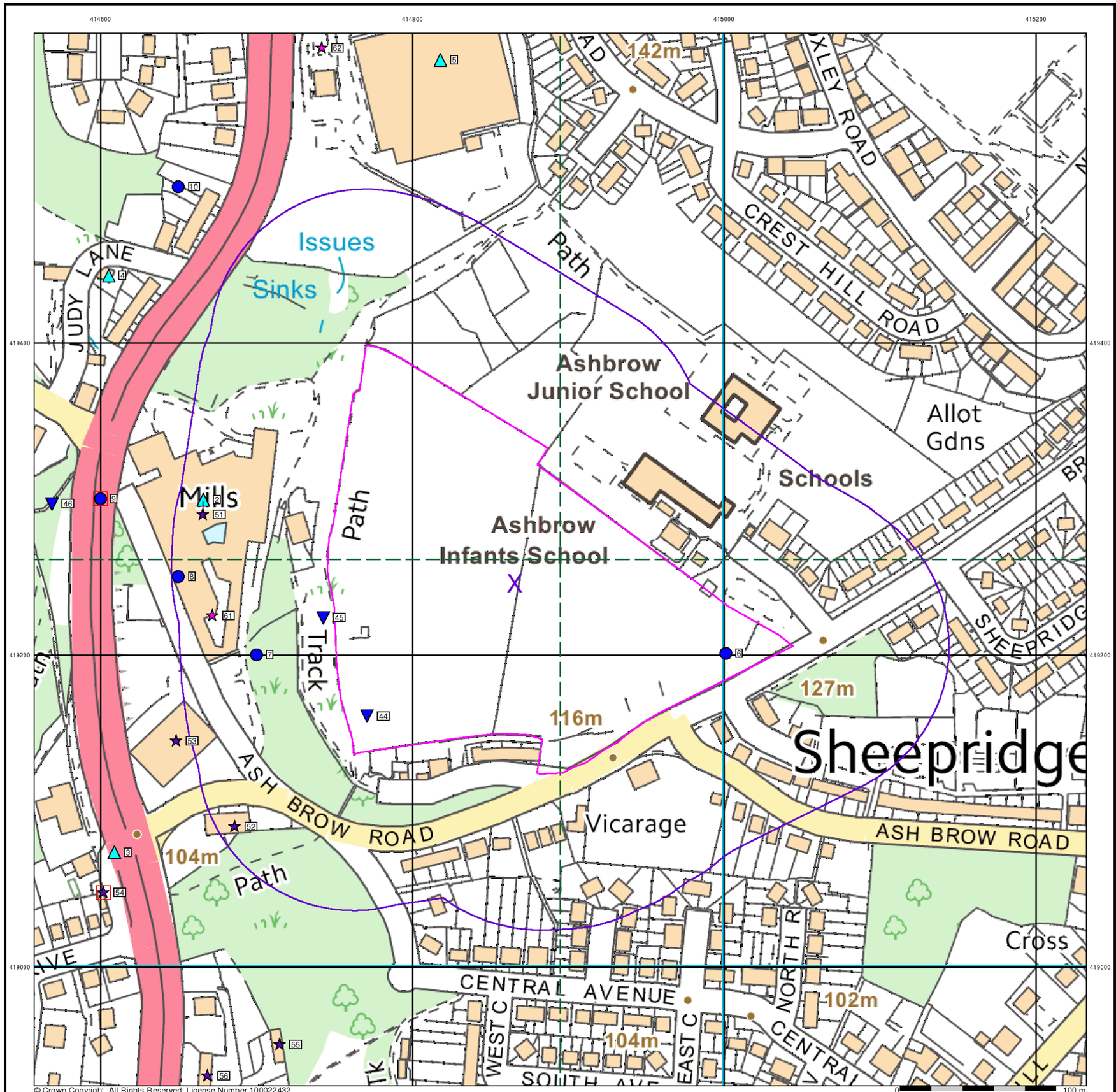
Sensitive Land Use	Version	Update Cycle
Areas of Adopted Green Belt		
Calderdale Metropolitan Borough Council	August 2014	As notified
Kirklees Metropolitan Borough Council	August 2014	As notified
Areas of Unadopted Green Belt		
Calderdale Metropolitan Borough Council	August 2014	As notified
Kirklees Metropolitan Borough Council	August 2014	As notified
Areas of Outstanding Natural Beauty		
Natural England	August 2014	Bi-Annually
Environmentally Sensitive Areas		
Natural England	August 2014	Annually
Forest Parks		
Forestry Commission	April 1997	Not Applicable
Local Nature Reserves		
Natural England	October 2014	Bi-Annually
Marine Nature Reserves		
Natural England	July 2013	Bi-Annually
National Nature Reserves		
Natural England	September 2014	Bi-Annually
National Parks		
Natural England	August 2014	Bi-Annually
Nitrate Sensitive Areas		
Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	February 2012	Not Applicable
Nitrate Vulnerable Zones		
Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	July 2014	Annually
Ramsar Sites		
Natural England	March 2014	Bi-Annually
Sites of Special Scientific Interest		
Natural England	September 2014	Bi-Annually
Special Areas of Conservation		
Natural England	March 2014	Bi-Annually
Special Protection Areas		
Natural England	September 2014	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	**Environment Agency - National Customer Contact Centre (NCCC)** PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 08708 506 506 Email: enquiries@environment-agency.gov.uk
3	**Kirklees Metropolitan Borough Council - Environmental Health Department** West Riding House, 9 Manchester Road, Huddersfield, West Yorkshire, HD1 3HH	Telephone: 01484 221000 Email: customer.relations@kirklees.gov.uk Website: www.kirklees.gov.uk
4	**British Geological Survey - Enquiry Service** British Geological Survey, Kingsley Dunham Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
5	**Landmark Information Group Limited** Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmark.co.uk Website: www.landmarkinfo.co.uk
6	**The Coal Authority - Mining Report Service** 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG	Telephone: 0845 7626848 Email: thecoalauthority@coal.gov.uk
7	**Peter Brett Associates** Caversham Bridge House, Waterman Place, Reading, Berkshire, RG1 8DN	Telephone: 0118 950 0761 Fax: 0118 959 7498 Email: reading@pba.co.uk Website: www.pba.co.uk
8	**Kirklees Metropolitan Borough Council** Town Hall, Civic Centre, Huddersfield, West Yorkshire, HD1 2TA	Telephone: 01484 221000 Fax: 01484 442768 Website: www.kirklees.gov.uk
9	**Calderdale Metropolitan Borough Council** Crossley House, Crossley Street, Halifax, West Yorkshire, HX1 1TP	Telephone: 01422 357257 Fax: 01422 392238 Website: www.calderdale.gov.uk
10	**Kirklees Metropolitan Borough Council - Planning Services** PO BOX B93, Civic Centre III, Off Market Street, Huddersfield, West Yorkshire, HD1 2JR	Telephone: 01484 221000 Fax: 01484 221613 Website: www.kirklees.gov.uk
-	**Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards** Chilton, Didcot, Oxfordshire, OX11 0RQ	Telephone: 01235 822622 Fax: 01235 833891 Email: radon@phe.gov.uk Website: www.ukradon.org
-	**Landmark Information Group Limited** Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk

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



Envirocheck®

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

Geological

- BGS Recorded Mineral Site

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry

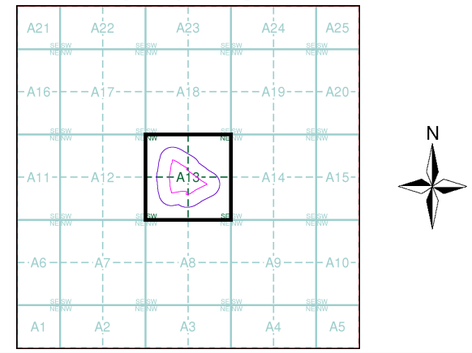
Waste

- 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

Site Sensitivity Map - Segment A13



Order Details

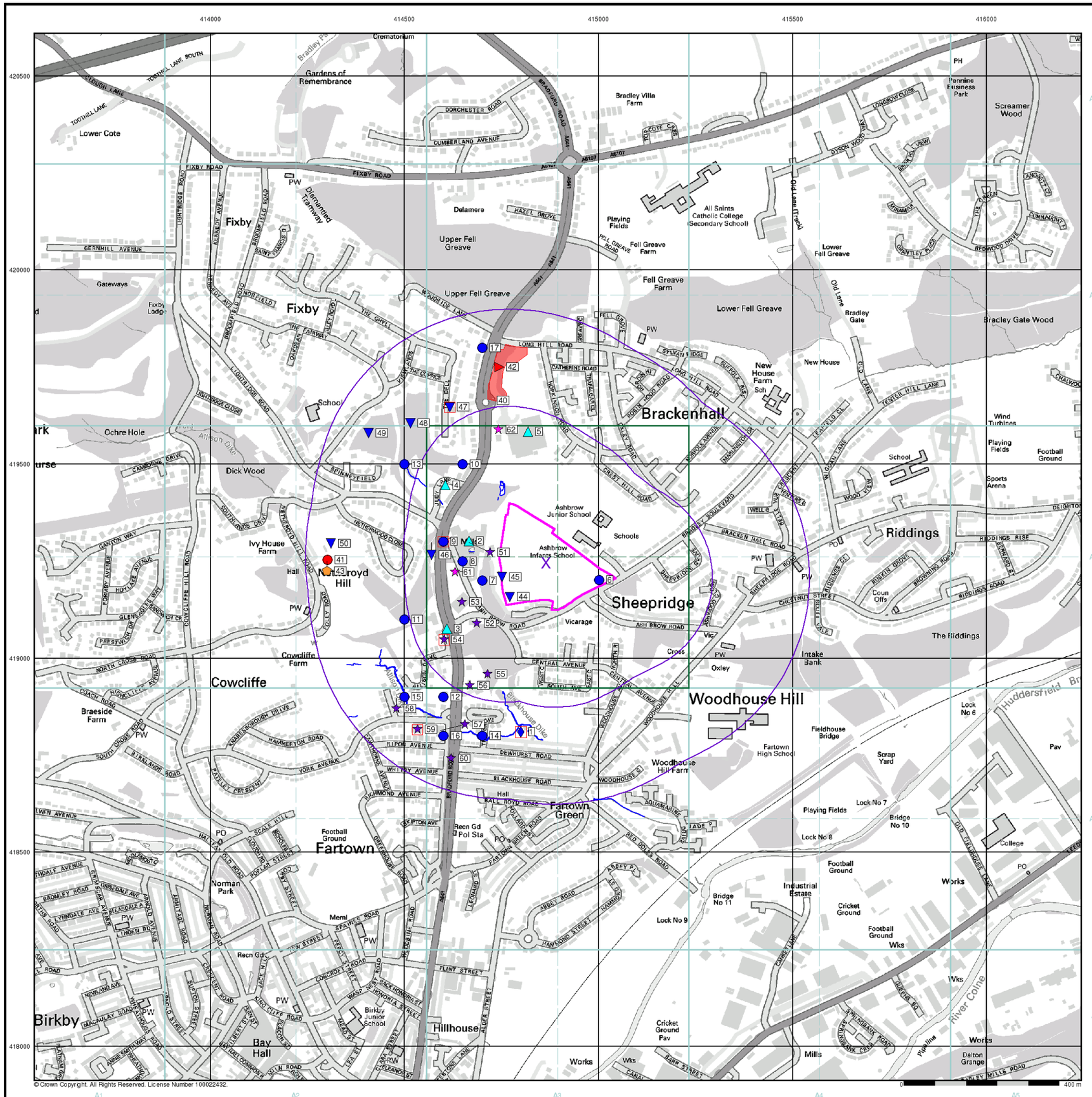
Order Number:	61553197_1_1
Customer Ref:	J2958/14/EDS
National Grid Reference:	414870, 419250
Slice:	A
Site Area (Ha):	4.51

Site Details

The School House, Ash Meadow Close, HUDDERSFIELD, HD2 1EX

Landmark® Information Group

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



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Envirocheck®

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
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- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
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- Water Abstraction
- Water Industry Act Referral

Geological

- BGS Recorded Mineral Site

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry

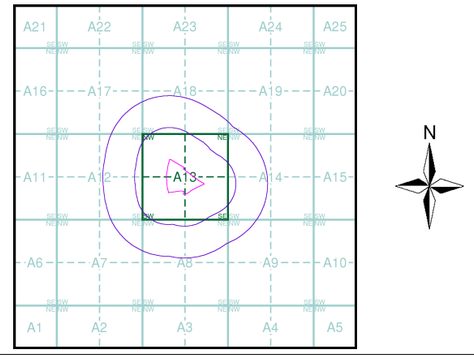
Waste

- 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

Site Sensitivity Map - Slice A



Order Details

Order Number:	61553197_1_1
Customer Ref:	J2958/14/EDS
National Grid Reference:	414870, 419250
Slice:	A
Site Area (Ha):	4.51
Search Buffer (m):	500

Site Details

The School House, Ash Meadow Close, HUDDERSFIELD, HD2 1EX

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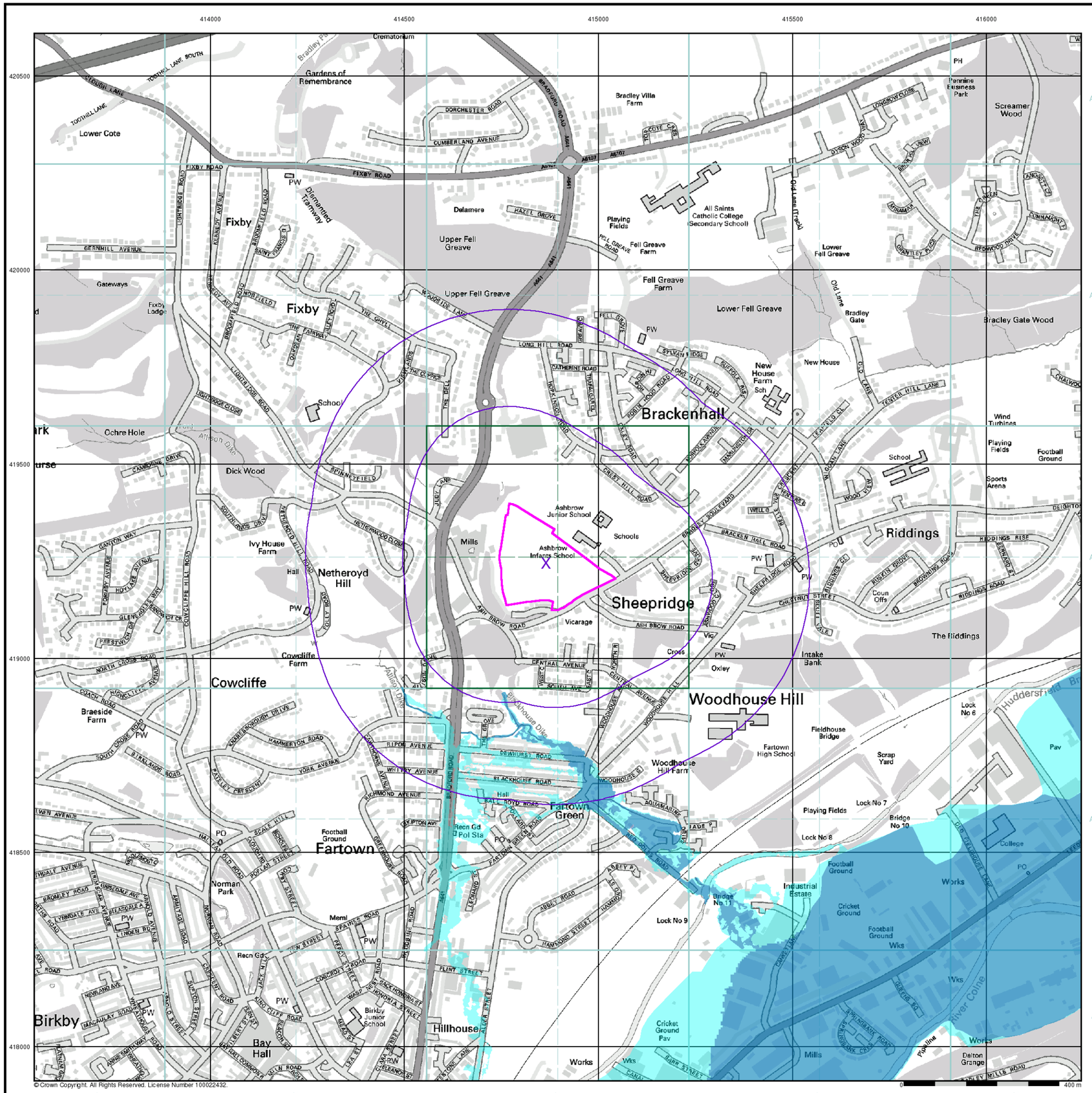
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Envirocheck®

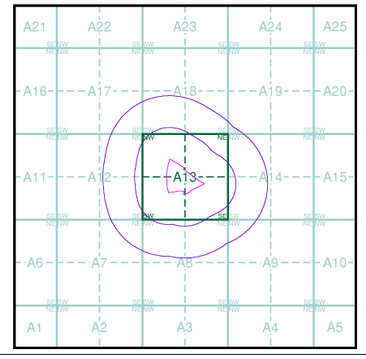
General

- Specified Site
- Specified Buffer(s)
- X 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:	61553197_1_1
Customer Ref:	J2958/14/EDS
National Grid Reference:	414870, 419250
Slice:	A
Site Area (Ha):	4.51
Search Buffer (m):	500

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