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DESK STUDY

AT

**FOUNTAIN WORKS,
LIVERSEDGE**

FOR

WHARFEDALE FINANCE CO.

Ashton Bennett

ENGINEERING GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS



KIRKLEES METROPOLITAN BOROUGH COUNCIL

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RECEIVED



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**PHASE I
DESK STUDY
AT
FOUNTAIN WORKS
LIVERSEDGE
FOR
WHARFEDALE FINANCE CO.**

ASHTON BENNETT CONSULTANCY
Engineering Geologists & Environmental Scientists

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1. INTRODUCTION

This report describes the results of a Phase 1 Geoenvironmental Desk Study undertaken on land situated at Fountain Works, Liversedge, Roberttown, West Yorkshire. The work was commissioned by Robert Halstead Chartered Surveyors acting on behalf of the clients Wharfedale Finance Co. and was carried out by this Consultancy, the Ashton Bennett Consultancy.

The purpose of this Phase 1 Study was to collate and assess information on the site including geological, hydrogeological and mining information, archival maps and historical review to determine past use, a database review, environmental data on water and soil, and to undertake a site reconnaissance to enable a desk top assessment to determine the likely presence and areas of environmental concerns on the site and the presence of pathways of migration and potentially sensitive receptors.

This report describes the research work carried out, presents the results of the desk study and from the conceptual model of the site makes recommendations regarding environmental risk.

2. THE SITE

The site lies to the west of the A62 Huddersfield Road on the east side of Roberttown between Liversedge and Mirfield in West Yorkshire. The site comprises a large brick built building primarily single storey with two storey offices to the rear. The roof is steel clad but the two adjoining buildings adjacent to the site are clad in corrugated concrete bonded asbestos. The building is set back from the main road with a tarmac car park to the front and to the rear.

The site lies around National Grid Reference 420000E 422450N at a height of 128m above Ordnance Datum. A site location plan is presented as Drg No WFC 2695/1 and a site plan is presented as Drg No WFC 2695/2.

Photographs of the site and buildings are in Appendix B.

The proposed use of the site is for indoor karting with hard cover indoors and hard cover on the car parking areas. No gardens or landscaped ground is proposed.

3. REPORT OBJECTIVE AND REPORT SCOPE

3.1 Report Objective

The objective of the desk study is to determine the environmental nature of the site and to establish any environmental concerns and liabilities with particular reference to past contaminative uses of the site as far as is possible from historical and database review. Contaminative use is defined as "any use of land which may cause it to be contaminated by toxic substances" (Section 143 of the Environmental Protection Act 1990). The report undertaken is a Phase I Desk Study and Risk Assessment taking into account the possible contamination, the migration pathways and the presence of potentially sensitive receptors and the mining history of the site.



3.2 Report Scope

The information for this report is from sources recommended by the Institute of Civil Engineers (ICE), the Association of Geotechnical and Geoenvironmental Specialists (AGS), Construction Industry Research and Information Association (CIRIA) and the Department of the Environment Transport and the Regions (DETR). The report has been compiled in accordance with the latest ICE, DETR, Department of Environment, Food and Rural Affairs (DEFRA) and British Standard Draft Documents and British Standards, particularly BS10175:2001.

In addition the scope of the investigation has used the extensive knowledge and experience of the staff of Ashton Bennett Consultancy to assess the data and to interpret the data findings.

4. SITE HISTORY

The following maps and plans were inspected to assess the history of the site and its environs.

TABLE 1
Historical Maps Inspected

DATE	DRG. NO.	SCALE	DESCRIPTION
1849-50	WFC 2695/3	NTS	This map indicates the site to be occupied by land associated with Mortimer House at this time. The Huddersfield Road ran south west to north east with Child Lane running southwest to north east to the west of the site. The surrounding area is occupied by open fields. A cotton mill and copperas works are situated almost directly north of the site. The Fountain Inn is clearly marked to the south at the cross roads. Coal Pits are shown north of Robert Town.
1894	WFC 2695/4	1:10,560	This map shows the site to be occupied by Fountain Pottery. A mill pond is situated directly north of the site. Two collieries, with coal pits and shafts surrounding it, existed to the north of the site while a brick works is situated to the south.
1908	WFC 2695/5	1:10,560	This map shows the site appears the same as on the previous map. The northerly most colliery is no longer annotated on the map. Southfield Colliery is shown to the northeast. Finching Dike is annotated on the map to the south of the site running west to east.
1930-1	WFC 2695/6	1:10,560	This map indicates the site had become a glass works with the construction of three factory sized buildings on site, north of Huddersfield Road. On this map it can be seen that residential houses are beginning to be constructed along the Huddersfield Road. Southfield Colliery to the north east is no longer annotated.
1938	WFC 2695/7	1:10,560	This map shows the site remained unchanged as did the surrounding area with the exception of increased residential housing along the Huddersfield Road.
1948	WFC 2695/8	1:10,560	This map indicates minor change to the site as seen on the map. A boundary has been erected around the glass works and a 'T' shaped building constructed to the immediate west of the site. Further residential buildings had been constructed along the Huddersfield Road and the



			surrounding area.
1955-6	WFC 2695/9	1:10,560	The map shows that the factory on site has been enlarged to the north to incorporate the previously distanced boundary. The surrounding area remains unchanged as this time.
1958	WFC 2695/10	1:2,500	This map indicates that the factories on and around the site have joined to become one factory with small outhouses randomly distributed all around. From the map a sub station and some tanks are situated to the south and east of the site respectively.
1966-7	WFC 2695/11	1:10,560	As can be clearly seen on this map the site remains unchanged as does the surrounding area. The residential areas are continuing to expand.
1974-7	WFC 2695/12	1: 10,000	The map indicates that the site is now surrounded on all sides by residential buildings. The site itself remains unchanged.
1988-9	WFC 2695/13	1:10,000	This map shows that the site remains unchanged while the residential area surrounding continues to grow.
1979-90	WFC 2695/14	1:1,250	This map indicates that the site remains the same, as does the surrounding area. The sub station and tanks are clearly marked on the map. A garage is situated to the south on the opposite side of the Huddersfield Road to the site.
1979-90	WFC 2695/15	1:1,250	This map indicates no change to the site or its surrounding area.
2008	WFC 2695/16	1: 1,250	This map shows small changes made to the factory to the west of the site where four buildings have been connected and made into one. The site itself remains unchanged.

In summary, the area is shown on the OS maps to have been used as open land and as a pottery and glassworks factory since before 1900 to date. The factory has grown in size throughout this time, most notably around 1930s and the 1950 and during this time the factory was predominantly used as a glass works.

The surrounding area was mainly open fields up until around the 1940s when residential houses were constructed along Huddersfield Road.

5. POTENTIAL CONTAMINATION

The site has been used as open land, a pottery and glass factory for over 100 years most of which time glass was produced. Potential contamination may arise from waste deposited from the factory which may have included arsenic and sulphates in ash and clinker from the furnaces for production.

Potential contaminants from the glass making and decorative processes may include lead, acids, oxides of metals, sulphates and solvents and lubricating oils.

A Conceptual Model of the site is presented as Drg No WFC 2695/17.



6. SITE GEOLOGY

6.1 Geology

The published British Geological Survey Map (BGS) at a scale of 1:10,000 shows the site to be underlain by mudstone, siltstones, sandstones and coal seams of the Carboniferous Middle Coal Measures of strata. The site is shown to be immediately underlain by sandstone underlain by the Blocking Coal and mudstones dipping at shallow angles of five to ten degrees to the horizontal to the northwest. The site is underlain at depth by further sandstones, mudstones and workable coal seams.

Superficial Drift deposits are not shown to overlie the solid strata.

6.2 Geological Faults

The BGS maps do not indicate the presence of any geological faults crossing the site. The maps show the presence of a large fault trending northwest to southeast to the southwest of the site and a large fault striking south west to north east to the north of the site. It is possible that smaller faults sub parallel to this may exist in the strata causing fissuring and fracturing to the rock. Due to the cessation of tectonic activity in the area, faulting is unlikely to detrimentally affect the stability of the site.

6.3 Engineering Geology

Made ground may be present on the site. The strata of the Coal Measures provides good bearing strata where unweathered and unfaulted for carrying the bearing pressures imposed by low rise development without undue settlement.

7. SITE HYDROLOGY AND HYDROGEOLOGY

7.1 Hydrology

The rainfall over the area of the site will leach through the ground and drain naturally to the south to Finching Dyke via ground percolation.

The site is shown by the Environment Agency not to lie within a fluvial flood risk area. There are no available river quality assessments for watercourses within 250m of the site.

It is important that any contamination found on site is not allowed to detrimentally affect the watercourses.

7.2 Hydrogeology

Geological maps produced by the BGS at a scale of 1:10,000 indicate the site to be underlain by sandstones, mudstones, siltstones and coal seams of the Carboniferous Coal Measures. Sandstones are permeable strata interbedded with less permeable mudstones and siltstones.

The Environment Agency Groundwater Vulnerability map indicates the site to lie on an area of a minor aquifer. These are formations, which do not have a high primary permeability, and do not produce high quantities of water for abstraction, but are important for local supplies and base flows to rivers.



The minor aquifer is overlain by soils of high leaching potential which readily transmit liquid discharges because they are shallow or susceptible to rapid flow directly to rock, gravel or groundwater, and are soils with little ability to attenuate diffuse source pollutants in which non absorbed diffuse source pollutants and liquid discharges have the potential to move rapidly to underlying strata or shallow groundwater. The minor aquifer comprises sandstone horizons within the Coal Measures strata and is covered by soils of high leaching potential. Care should be taken not to intrude into any aquifer and cause pollution to enter the aquifer.

Groundwater is not expected to lie at shallow depths below ground level. Groundwater is expected to be present at depth in the unweathered sandstone bedrock.

The Environment Agency holds no details of any water abstractions within 1000m of the site.

As the local groundwater may be utilised for abstraction from old unlicensed wells, it is important that it is protected from pollution. It is an offence to pollute the groundwater, whether or not it is used for abstraction.

The Environment Agency holds no record of an authorisation issued by the Environment Agency to discharge to watercourses in accordance with the Water Resources Act 1991, within 250m of the site.

8. QUARRYING AND MINING

8.1 Quarrying

The British Geological Survey Mines and Quarries Survey 1998 does not indicate any existing quarries on or within 250m of the site. However the archival OS maps indicate small pits on the site possibly for extraction of clay for the former pottery works. Made ground may therefore lie on the site as infill to the pits.

8.2 The Coal Authority Report

The Coal Mining Report obtained from The Coal Authority for the site states that the property lies in the likely zone of influence from workings in 3 seams of coal the Blocking Bed, Better Bed and Black Bed Coal seams at 50m to 250m depth, and last worked in 1918. Any ground movement from these coal workings should have stopped by now.

The site lies on an area where coal is believed to be at or close to the ground surface. This coal may have been worked at some time in the past. If development is proposed for the site it would be prudent to investigate the depth to coal to check for the presence of shallow workings. If voids remain in mined coal seams at shallow depth (<30m bgl) it is possible for the voids to migrate by successive roof collapse to the ground surface and cause subsidence if there is insufficient competent strata overlying the void.

The Coal Authority Report is presented in Appendix A and should be read in full.



9. WASTE DISPOSAL AND WASTE TREATMENT

Statutory registers hold records of zero landfill sites or waste management facilities, waste transfer or treatment sites licensed by the Environment Agency under Part II of the Environmental Protection Act 1990 on or within 250m of the site.

10. REGULATED INDUSTRIES

The Environment Agency, Health and Safety Executive, the DETR and Local Authorities hold records of radioactive consents, integrated pollution control, hazardous substances consent, enforcements and prosecutions, chemical release inventories and NIHSS sites.

There are no records of sites regulated by the Health and Safety Executive (HSE) under the Control of Major Accident Hazards (COMAH) Regulations 1999 on or within 250m of the site.

The Environment Agency holds no records of sites that are subject to prosecutions or enforcement action by the Environment Agency under the criminal or regulatory provisions of the Environmental Protection Act 1990, on or within 250m of the site.

There are no sites on or within 250m of the site which are subject to hazardous substances consents granted by the relevant Local Authority under the Planning (Hazardous Substances) Act 1990, or which are regulated by the Health and Safety Executive for storing specific dangerous substances under the NIHSS Regulation 1982.

There are no recorded sites authorised by the Environment Agency under Part 1 of the EPA 1990 to carry out processes subjected to Integrated Pollution Control (IPC) and no records of Integrated Pollution Prevention and Control (IPPC) within 250m of the site.

There is one record of a site authorised by the Environment Agency for Local Authority Pollution Prevention and Control within 250m of the site. Rydal garage is 48m south east of the site at 269 Huddersfield Road, Liversedge. The license is held for Local Authority Air Pollution Control and specifically for a petrol filling station. The license is now revoked.

Over the last 10 years, there have been no recorded pollution incidents to controlled waters within 250m of the site.

No incident recorded is likely to have detrimentally affected the site.

The site is not likely to be detrimentally affected by any regulated industries.

11. ENVIRONMENTALLY SENSITIVE AREAS

11.1 Land

According to the Countryside Commission the site does not lie within a National Park or area of Outstanding National Beauty or an area of Adopted Green Belt.

According to English Nature the site does not lie within a Special Protection Area, National Nature Reserve and it is not a Site of Special Scientific Interest or within a Special Area of Conservation, or RAMSAR site.



DEFRA records indicate that the site does not lie within a Nitrate Sensitive Area, or within an Environmentally Sensitive Area. The site, however, does lie within a Nitrite Vulnerable Zone.

11.2 Humans and Livestock

There is occupied residential property within 250m of the site and these are possible sensitive receptors to any contamination present on the site.

11.3 Water

Finching Dike lies within 500m of the site and is a potential sensitive receptor. The site does not lie in a Source Protection Zone.

12. RADON

Radon is a radioactive gas derived from naturally occurring uranium found in small quantities in soils and rock. The National Radiological Board recommends that where radon concentration exceeds the Action level of 200 Bqm⁻³ the householder should take measures to reduce it. The Coal Measures Sandstones have been known to emit radon gas.

According to the BGS the site is in an area where basic radon protection measures are not required in new buildings. According to the National Radiological Protection Board, the site lies within an area where less than 1% of houses lie above the action level.

13. AREAS OF POTENTIAL CONTAMINATION

The potential for contamination on the site is expected to be medium/low risk and derived from waste materials deposited within former clay pits on the site to level the ground and from waste ash and clinker, oxides of metals, acids, sulphates and hydrocarbons deposited during its use as a pottery and glass factory.

On archival evidence, the site classifies as medium/low risk for the probability of being contaminated. The risk of contamination causing harm can only be assessed by detecting contamination and by identifying possible migration paths for its movement and identifying sensitive receptors to harm.

No specific areas of potential contamination were identified on the site during the site reconnaissance. No landfill sites lie on or within 250m of the site.

14. ENVIRONMENTAL RISK ASSESSMENT

14.1 Introduction

It is proposed to develop the site for an indoor go-kart track open to the public with hard standing indoors and outside. The environmental liabilities of the site and risk assessments have been undertaken for this potential future use.



Environmental risk considerations on the site have been assessed by adopting a site specific qualitative approach to identify the risk, if any, of environmental harm. In accordance with the DETR Draft Statutory Guidance on Contaminated Land the approach is by identifying a hazardous source and establishing possible links between the source via exposure pathways to a potential receptor.

The hazard is a contaminant or potentially polluting substance that is in, on or under the land and which has the potential to cause harm or to cause pollution to controlled waters. The receptor is a living organism or organisms, an ecological system or piece of property, which is being harmed, interfered with or polluted by the contaminant. The pollutant linkage is by means of the pathway which is one or more routes by or through which that receptor is being, or could be, exposed to, or affected by, that contaminant. Thus the presence of a hazard on a site does not necessarily mean that there are risks unless pathways and receptors are present and are receptive to being affected by that specific hazard or contaminant.

SOURCE	release of pollutant	PATHWAY	route to receptor	RECEPTOR
eg. oil spills		eg. permeable strata		eg. River

The likelihood of contamination affecting the environment depends on the migration and persistence of contaminants which varies with the nature of the contaminant and the ground and groundwater conditions, and the presence of sensitive receptors.

The likelihood or risk of sensitive receptors being affected is based on a very low/low/medium/high/very high risk rating.

Very Low	=	It is very unlikely that an environmental risk exists, no remediation
Low	=	It is unlikely that an environmental risk exists, remediation unlikely
Medium	=	It is possible that an environmental risk exists, remediation possible
High	=	It is likely that an environmental risk exists, remediation probable
Very High	=	It is very likely that an environmental risk exists, remediation certain

Any category which shows as medium risk or above may require investigation and if high risk is proven, remediation may be required following investigation.

On this site the potential for contamination is considered to be a medium/low risk. The proposed future use of the site will be for a karting centre, and the risk assessment has been based on this future use of the site. If the site is to be used for any other use in the future then a further risk assessment may be necessary. The site has not been assessed for residential use.

14.2 Potential Sources of Contamination, Pathways and Receptors

14.2.1 Potential Sources of Contamination

Potential sources and areas of contamination were investigated through archival maps and a site reconnaissance. The site has been used as a pottery and glass factory.

The site may contain potential contaminants resultant from its current and former uses and from the uses of adjacent land.

14.2.2 Potential Pathways for Migration

The potential pathways for carrying any contamination present on the site to reach sensitive receptors may include:



- a) Ingestion of and/or skin contact with contamination in the soil
Low – the site will be developed as a karting centre with hard cover indoors and outdoors in the car parking area. No gardens or landscaped ground are planned and therefore the ingestion and skin contact pathways are eliminated. Contamination could detrimentally affect workmen during any groundworks undertaken which may be mitigated by appropriate use of Personal Protective Equipment.
- b) Ingestion of contamination in and uptake of contamination in plants/vegetables/animals
Low – No gardens or landscaped ground will be present and therefore ingestion pathways via vegetables, plants and animals is eliminated. No animals in the food chain will be present on site.
- c) Ingestion of contaminated drinking water through leaching of contamination into groundwater flowing to underlying aquifers/water abstractions
Low – leaching of any contamination may detrimentally affect groundwater although it is not anticipated at shallow depth. No water abstractions lie within 250m and therefore drinking water is not expected to be detrimentally affected by the site. The site does not lie within a water source protection zone. Underlying aquifers are classified by the Environment Agency as minor.
- d) Inhalation of vapours produced by landfill/radon/hydrocarbons/old mines
Medium – There are no recorded landfill sites on or within 250m of the site. However it is expected that infilled clay pits underlie parts of the site and adjacent ground. The site does not lie in a radon protection area. There may be shallow mining beneath the site. Monitoring for toxic gases is not required for landfill gas however if the site is redeveloped in the future then monitoring will be required to assess risk of toxic gases from made ground and from shallow mining if found to be present beneath the site.
- e) Inhalation of contaminated airborne dust
Low – The appropriate safety measures must be exercised to protect both the workers and the local residents from dust during any demolition and/or construction. Provided this work is carried out diligently, the ongoing risk is low.
- f) Contamination of controlled waters
Low – Leaching of contamination into surface water and groundwater is unlikely as surface water is distant and groundwater is not expected to lie at shallow depth.

It is considered a low risk that potential contamination on the site could migrate and detrimentally affect surface water, groundwater, local residents or the environment. It is considered a medium risk that made up ground and/or shallow mining beneath the site may contain toxic gases. The risk of workmen being detrimentally affected by contamination and/or gases can be mitigated by the provision of personal protective equipment for workmen undertaking any groundwork.

14.2.3 Potential Sensitive Receptors

By considering where a viable pathway exists which connects a source to a receptor, this assessment will identify where pollutant linkages may exist. If there is no pollutant linkage, then theoretically there is no risk. Therefore only where a viable pollutant linkage is established does this assessment go on to consider the level of risk. On this site there is a

medium/low potential for contamination to exist viable pathways are present for distribution of contamination and sensitive receptors are present.

TABLE 2
Risk Assessment for Commercial Use

Pathways	Receptors	Risk	Probability of Risk	Severity of Risk Risk Reduction
Inhalation of vapours from infilled ground and methane from shallow mining.	Existing/future users of the site and workmen.	Low as no landfill lies within 250m. However made ground and shallow mining may be present. Radon protection not required.	Medium to low provided precautions undertaken	Methane can be explosive in air. No recorded landfills within 250m, no radon. If made ground and shallow mining monitoring and protective measures required for new development.
Ingestion of and/or skin contact from contaminated soil	Existing/future users of the site and workmen	Low as no gardens or landscaped areas. Site comprises hard cover.	Low	Low can be reduced by use of PPE during any groundwork.
Ingestion of contaminated drinking water	Local abstraction wells	Low as no abstraction wells. Site not in source protection zone.	Low	High consequences if potable water is contaminated. Risk reduced due to distance to abstraction wells.
Transportation by surface and/or groundwater	Groundwater and Finching Dyke	Contamination is unlikely to affect watercourses due to distance, and groundwater is unlikely to be at shallow depth.	Low	High, prosecution can occur if site is affecting controlled waters. Risk low due to distances from site and depth to groundwater.
Ingestion and uptake of contamination in plants/animals/vegetables	Future occupants of site	Low as no gardens, landscaped areas or allotments are planned.	Low	Low risk as no allotments planned and no gardens or landscaped ground and hard cover.
Inhalation of airborne dust	Workmen & future users of the site	Low.	Low for workers Low for users	Low consequences reduced provided precautions undertaken during demolition/construction for dust control.

PPE = Personal Protective Equipment

It is unlikely that the site is detrimentally affecting sensitive receptors off the site.

The potential sensitive receptors on the site, once the site is developed for a hard covered karting centre with hard cover car parking, which could be detrimentally affected by any contamination and the likelihood of them being affected are identified in Table 2. Risks require identification and assessment to determine mitigating and/or protective measures.

With regard to human health, it is considered unlikely that humans on or outside the site are being detrimentally affected due to the low level of contamination anticipated and the existing



hard cover. Humans who will be working on the site, particularly during demolition and groundwork may be affected if they do not take the appropriate Health and Safety precautions. Future users of the karting centre are unlikely to be detrimentally affected by any residual contamination remaining on the site from its former use as the site will be fully hard covered with no gardens or landscaped ground thus eliminating potential pathways. The use of protection from methane and radon are not required as no landfill sites lie within 250m and the BGS indicate radon protection is not required. However if made ground and/or mined ground is encountered beneath the site in any redevelopment then monitoring for landfill and mine gas may be required.

14.3 Risk Assessment

The risks have been assessed purely on the Phase I Desk Study undertaken and on the assumption that the site will in the future be used for commercial use as a karting centre with full hard cover.

The potential contamination, pathways and receptors were taken into account during the Desk Study. The assessment of the likelihood of receptors being affected detrimentally is that it is unlikely that groundwater or surface water is being polluted. It is considered unlikely that land or humans adjacent to the site are being detrimentally affected by any contamination on the site. It is possible that workmen particularly ground workers may be detrimentally affected by undetected contamination which could be mitigated by the use of appropriate personal protective equipment during contact with the soil. It is unlikely that users of the site for karting could be detrimentally affected by any undetected contamination due to the hard cover and elimination of pathways between the ground and the sensitive receptors.

If the site is redeveloped in the future for any other use it is recommended that an intrusive investigation is undertaken to assess the presence of made ground and shallow mining beneath the site.

15. RECOMMENDATIONS

Potential contamination on the site is likely to be derived from infill to the small clay pits on the site and from waste ash and clinker from the furnaces and from metals and chemicals used for the glass manufacture.

Based on the proposed commercial use of the site and the full hard cover across the site it is unlikely that any undetected contamination contained in made ground on the site could detrimentally affect users of the site. It is low risk that groundwater or surface water, adjacent land or adjacent occupiers could be detrimentally affected by contamination on the site. Full hard cover should be retained on the site for protection to site users and to prevent leaching of contamination into the underlying sandstone.

If the site is redeveloped in the future it is recommended that a Phase II intrusive ground investigation is undertaken to establish whether any material is sufficiently contaminated to warrant further action and that a mining ground investigation is undertaken to assess the presence or otherwise of voids within shallow mined ground beneath the site. If made ground and/or shallow mined ground are detected monitoring for toxic gases should be undertaken.



16. GENERAL REMARKS

This report truly reflects the conditions found during the desk study. Whilst the desk study was undertaken in a professional manner taking due regard of additional information which became available as a result of ongoing research, the results portrayed only pertain to the information attained, and the ground conditions, mining conditions and contamination expected and it is possible that other undetected information and undetected ground and gas conditions, mining conditions and undetected contamination may exist. The desk study was only undertaken within the site boundaries and should not be used for interpretation purposes elsewhere. These conclusions are only a brief summary of the report, and it is recommended that the report is read in full to ensure that all recommendations have been understood.

This report is provided for the sole use of the client (Wharfedale Finance Co.) and no responsibility will be accepted by this Consultancy to any other parties who rely on this report entirely at their own risk. The copyright for this report is held by Ashton Bennett Consultancy and no reproduction of any part or all of the report can be undertaken or any other reproduction undertaken without the written approval of this Consultancy.

Tristan T A Bennett
BSc.

A handwritten signature in blue ink, appearing to read 'Frances A Bennett', is written over a faint rectangular stamp.

Frances A Bennett
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17. REFERENCES

- 1 Harris, M R, Herbert, S M, & Smith, M A. Remedial Treatment for Contaminated Lane Volume III – “Site Investigation & Assessment”. CIRIA Report SP103. 1995.
- 2 Harris, M R & Herbert, S H. “Contaminated Land: Investigation, Assessment & Remediation”. ICE Design & Practice Guide. 1994.
- 3 Department of the Environment. CLR Report No 1 “A Framework for Assessing the Impact of Contaminated Land on Groundwater and Surface Water”. 1994.
- 4 Department of the Environment. CLR Report No 2 “Guidance on Preliminary Site Inspection of Contaminated Land”. 1994.
- 5 Department of the Environment. (1994). CLR Report No 3 “Documentary Research on Industrial Sites”.
- 6 Department of the Environment. (1994). CLR Report No 4 “Sampling Strategies for Contaminated Land”.
- 7 DETR. CLR Report No 12. “A Quality Approach for Contaminated Land Consultancy”. 1997.
- 8 Department of the Environment. Waste Management Paper No. 27. Landfill Gas: A Technical Memorandum and Control of Landfill Gas. 1992.
- 9 Department of the Environment. Waste Management Paper No 26A. (1994) Landfill Completion: A Technical Memorandum Providing Guidance on Assessing the Completion of Licensed Landfill Sites. Hugo, London.
- 10 Department of the Environment – Interdepartmental Committee on the Redevelopment of Contaminated Land (ICRCL) “Guidance on the Assessment and Redevelopment of Contaminated Land”, ICRCL Guidance Note 59/83 (2nd Edition). 1987.
- 11 Building Research Establishment. BRE Special Digest I “Concrete in aggressive ground Part I Assessing the aggressive chemical environment. 2003.
- 12 British Standards Institution. Investigation of Potentially Contaminated Sites – Code of Practice. BS 10175:2001.
- 13 British Standards Institution. BS 5930, “Code of Practice for Site Investigation. 1999.
- 14 Environment Agency. R & D Publication 20. Methodology for the Derivation of Remedial Targets for Soil and Groundwater to Protect Water Resources. 1999.
- 15 Building Research Establishment. BRE Report. Radon:Guidance on Protective Measures for New Dwellings. 1992 rev.
- 16 British Geological Survey. BGS Technical Report WP/95/2. Radon and background radioactivity from natural sources: characteristics, extent and relevance to planning and development in Great Britain.
- 17 Department of the Environment – Interdepartmental Committee on the Redevelopment of Contaminated Land (ICRCL) “Asbestos on Contaminated Sites: ICRCL Guidance Note 64/85 (2nd Edition) 1990.
- 18 Environmental Protection Act 1990, Chapter 43. HMSO, London.
- 19 Alloway, B J and Ayers, D C (1993). Chemical Principals of Environmental Pollution. Blackie Academic and Professional, Glasgow.
- 20 Pollard, S and Guy J (2001). Risk Assessment for Environmental Professionals. CIWEM.
- 21 Wray D A The Mining in the Huddersfield District. Huddersfield Museum Handbook No V1.1929 pp 1-24.
- 22 Holmes D H Mining and Quarrying Industry in the Huddersfield District.
- 23 Urban Task Force (2000). A Standard Land Condition Record.

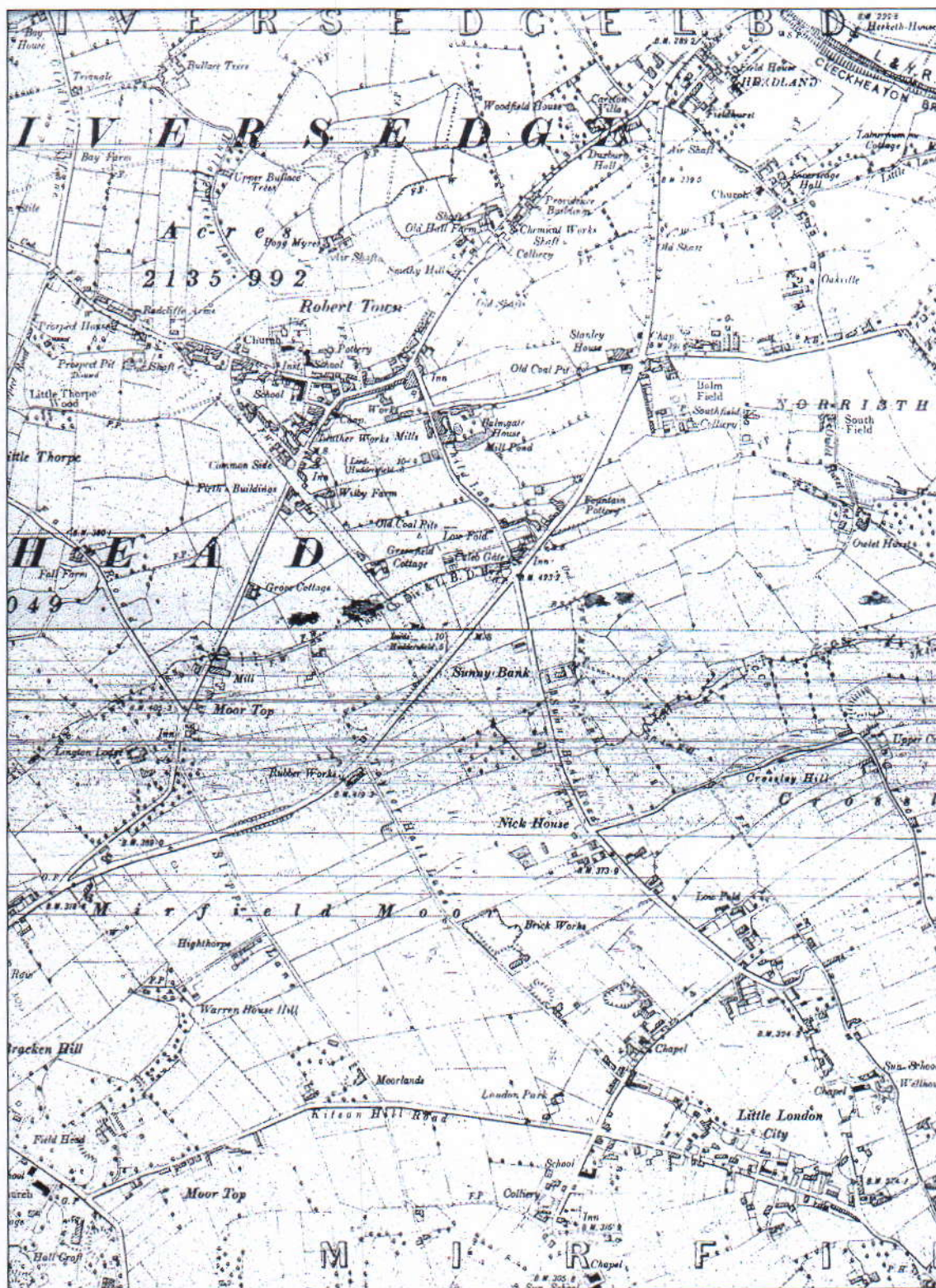


- 24 Syms P M (1994b) The Post Remediated Values of Contaminated Land. Paper presented at The Institution of Water and Environmental Management symposium on "Contaminated Land – from Liability to Asset", 7/8 February 1994, Birmingham.
- 25 Syms P M (1995a) Environmental Impairment: an approach to valuation. In proceedings of the RICS, "Cutting Edge 95", Research Conference, University of Aberdeen, Royal Institution of Chartered Surveyors, London.
- 26 Syms P M (1997) Contaminated Land: The Practice and Economics of Redevelopment. Blackwell Services Ltd, Oxford.
- 27 Hester, R E and Harrison R M (1997) Contaminated Land and its Remediation. Thomas Telford.
- 28 Institute of Petroleum (1993) Code of Practice for the Investigation and Mitigation of Possible Petroleum Based Land Contamination. Institute of Petroleum, London.
- 29 DETR (1995) A Guide to Risk Assessment and Risk Management for Environmental Protection. HMSO, London.
- 30 EC Groundwater Directive 80/68/EEC on the protection of groundwater against pollution caused by certain dangerous substances. Brussels 1979.
- 31 Towards an Urban Reconnaissance. Final Report of the Urban Task Force. Chaired by Lord Rodgers at Riverside, London, (1999).
- 32 Terzaghi, K and Peck, R.B., Soil Mechanics in Engineering Practice, 2nd Edition. John Wiley, New York. (1967)
- 33 Tomlinson, M. J.(2001). Foundation Design and Construction. 7th Edition. Prentice Hall.
- 34 Stroud, M.A., The Standard Penetration Test in insensitive clays and soft rock. Proceedings of the European Symposium on Penetration Testing. 2, 367-375, (1975)
- 35 R and D Publications. SGV 1, 3, 4, 5, 7, 9 and 10, Tox 1, 3, 4, 5, 6, 7, 8 and 10, CLR 8, 9 and 10. DEFRA and Environment Agency. WRC (2002).
- 36 Environmental Quality Objectives in the Netherlands 1994. Ministry of Housing, Spatial Planning and Environment. 1994.
- 37 Society of the Chemical Industry, Site Investigation and materials problems in Proceedings Conference on Reclamation of Contaminated Land, Eastbourne, October 1979.
- 38 UK Water Supply (Water Quality) Regulations 1989 and 2000.
- 39 WHO Guidelines Drinking Water Quality, Volume 2 Health Criteria and other supporting Information. Geneva 1984.
- 40 EC Council Directive 98/83/EC of 3rd November 1998 on the quality of water for human consumption. 1998.
- 41 British Geological Survey. Geology of the Country around Leeds. HMSO 1940.
- 42 British Geological Survey. Applied Geological Mapping of Leeds. HMSO 1995.
- 43 M.J. Tomlinson, Foundation Design and Construction. Seventh Edition. Prentice Hall (2001)













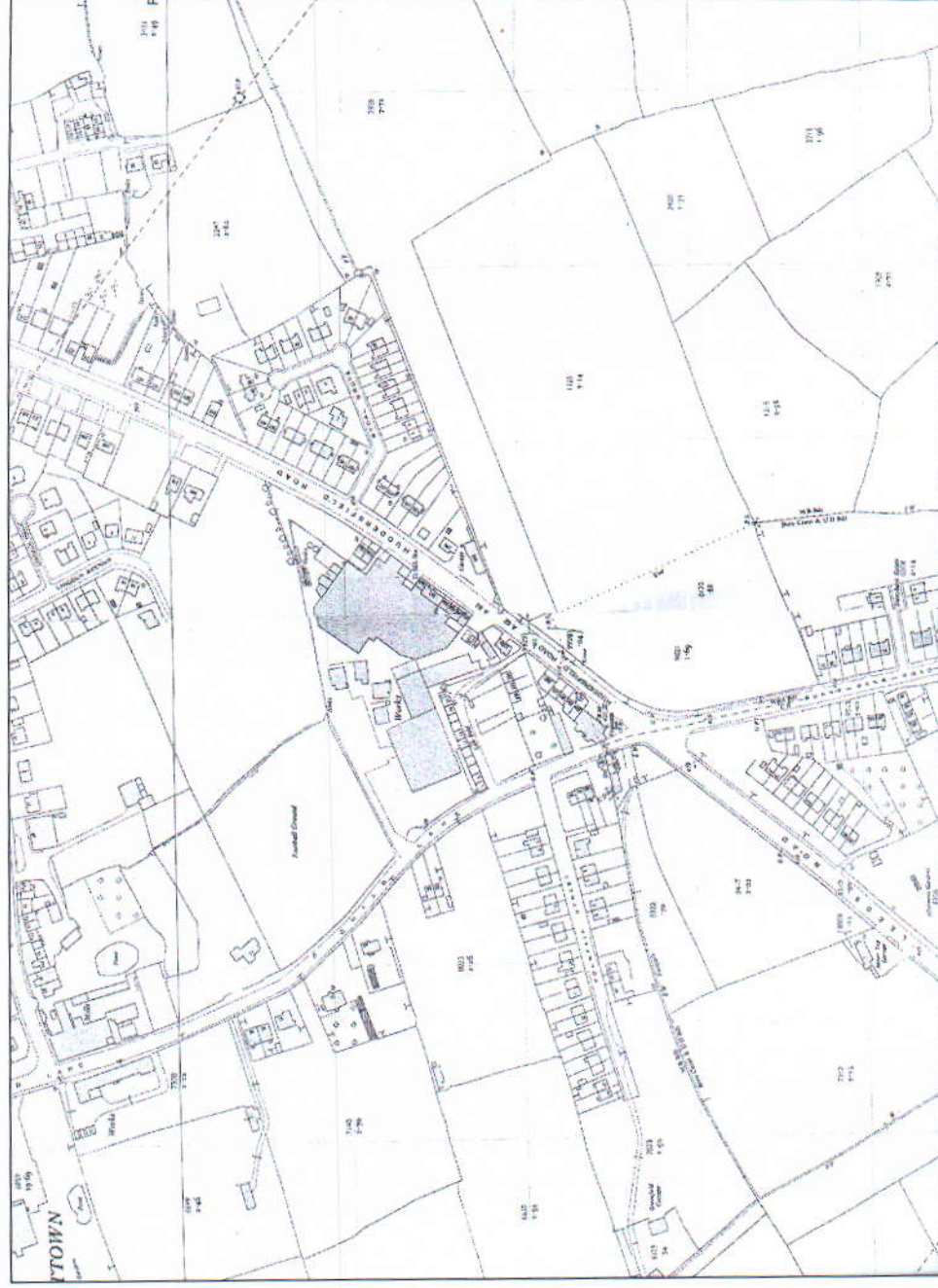






FOUNTAIN WORKS, LIVERSEDEGE

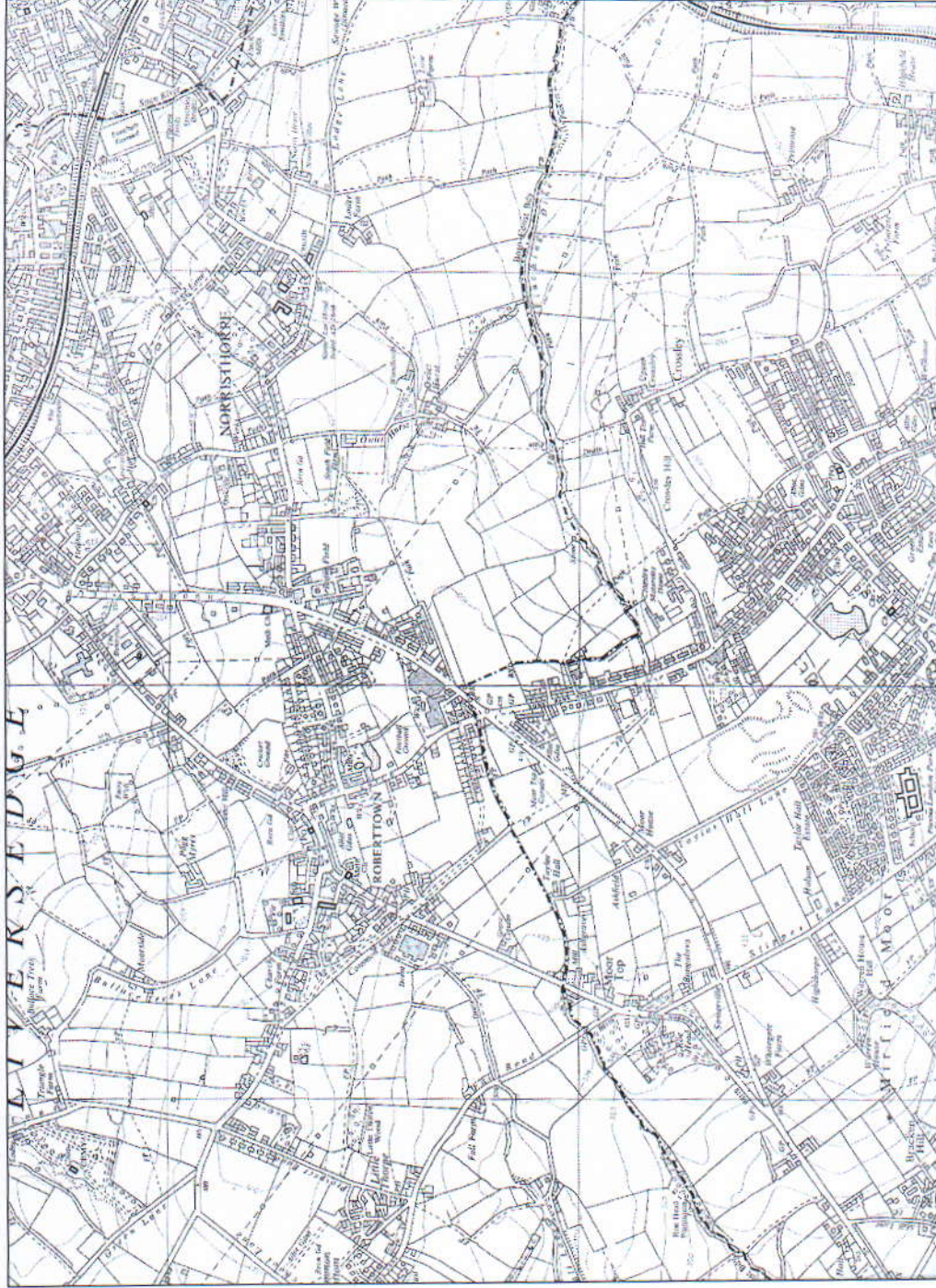
OS MAP 1958



Ashton Bennett Consultancy

Scale: 1:2,500 Reduced

Drg. No. WFC 2695/10



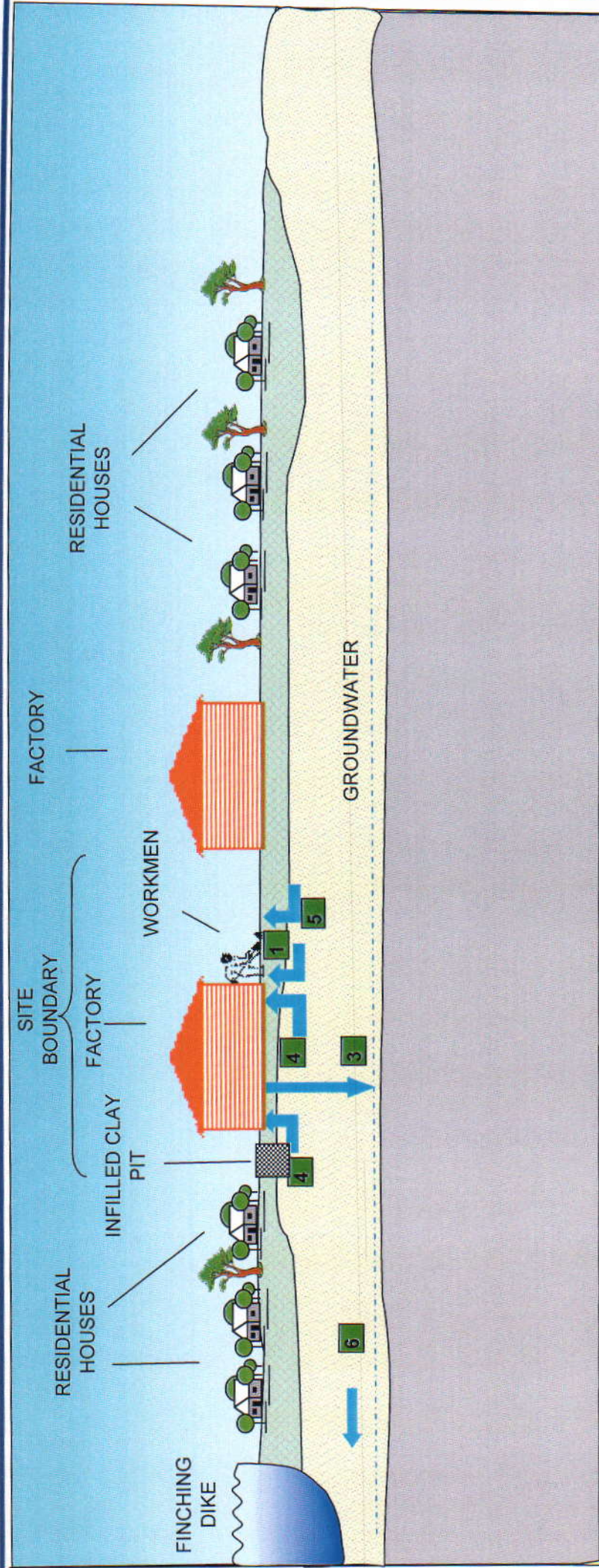












SOURCES
HISTORICAL USE AS OPEN GROUND POTTERY with clay pits GLASS WORKS

PATHWAYS
1 Ingestion and/or skin contact.
2 Ingestion via plants/animals/vegetables
3 Ingestion of contaminated drinking water
4 Inhalation of vapours, eg methane, radon hydrocarbons
5 Inhalation of contaminated dust
6 Leaching of contamination to groundwater and/or surface water

RECEPTORS
On-site workers
Workers
None
Workers
Workers
minor aquifer

RISK
Low
none as hard covered No abstractions
Low/Medium no landfill but infilled clay pits
Low
Low as hard covered, aquifer protected

GEOLOGY KEY
WEATHERED SANDSTONE
SANDSTONE
MUDSTONE

Ashton



Bennett

Consultancy
Engineering Geologists and Environmental Scientists

APPENDIX A

COAL AUTHORITY REPORT

Issued by:

The Coal Authority, Mining Reports Office, 200 Lichfield Lane, Berry Hill, Mansfield, Nottinghamshire NG18 4RG
On-Line Service: www.coalminingreports.co.uk - Phone: 0845 762 6848 - DX 716176 MANSFIELD 5

ASHTON BENNETT CONSULTANCY,
FIELD END LANE,
HOLMBRIDGE,
HOLMFIRTH,
WEST YORKSHIRE,
HD9 2NH

Person dealing with this matter:	Darren Moody
Our reference:	00038198-08
Your reference:	2695
Electronic Ref:	
RRUID:	007.00022902000001
Date of your enquiry:	27 May 2008
Date we received your enquiry:	27 May 2008
Date of issue:	27 May 2008

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

Coal and Brine Report

Fountain Works, Huddersfield Road, Liversedge, West Yorkshire

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

Coal mining	Yes
Brine extraction	No

Information from the Coal Authority

Underground Coal Mining

Past

The property is in the likely zone of influence from workings in 3 seams of coal at 50m to 250m depth, and last worked in 1918.

Any ground movement from these coal workings should have stopped by now.

In addition the property is in an area where the Coal Authority believe there is coal at or close to the surface. This coal may have been worked at some time in the past.

Present

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

Future

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

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

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

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

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

Mine entries

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

Records may be incomplete. Consequently, there may exist in the local area mine entries of which the Coal Authority has no knowledge.

Coal-mining geology

At the surface, there are no known faults or other lines of weakness due to coal mining that have made the property unstable.

Opencast Coal Mining

Past

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

Present

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

Future

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

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

Coal-mining subsidence

The Coal Authority has not received a damage notice or claim for the property since 1 January 1984. There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority has not received a request to carry out preventive work before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

Mine gas

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

Hazards related to coal mining

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

Withdrawal of Support

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

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

Working Facilities Orders

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

Payments to Owners of Former Copyhold Land

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

Comments on Coal Authority information

Where development proposals are being considered, technical advice should be obtained before beginning work on site. All proposals should apply good engineering practice developed for mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or mines of coal without the permission of the Coal Authority. This is necessary due to the Public Safety implications of any development in these circumstances.

Information from the Cheshire Brine Subsidence Compensation Board

The property lies outside the Cheshire Brine Compensation District.

Additional remarks

This report is prepared in accordance with the Law Society's Guidance Notes 2006, the User Guide 2006 and the Coal Authority and Cheshire Brine Board's Terms and Conditions 2006. The report is compliant with Home Information Pack requirements.

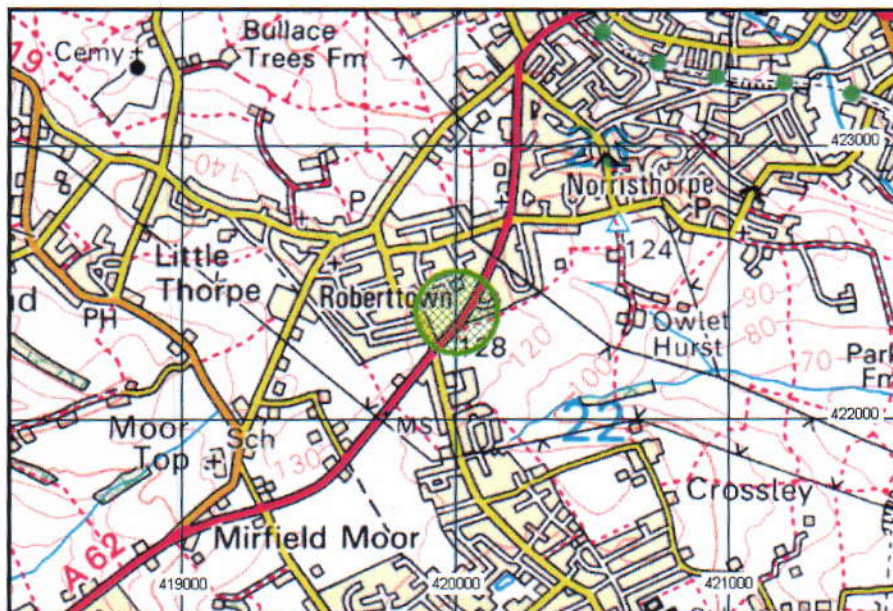
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Issued by:	The Coal Authority, 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG
Date:	27 May 2008
Ground stability report at:	Fountain Works, Huddersfield Road, Liversedge, West Yorkshire
Reference number:	00038198-08
Cost:	£42.56
Plus VAT:	£7.44
Total received:	£50.00
VAT registration number:	598 5850 68

Location map



Approximate position of property

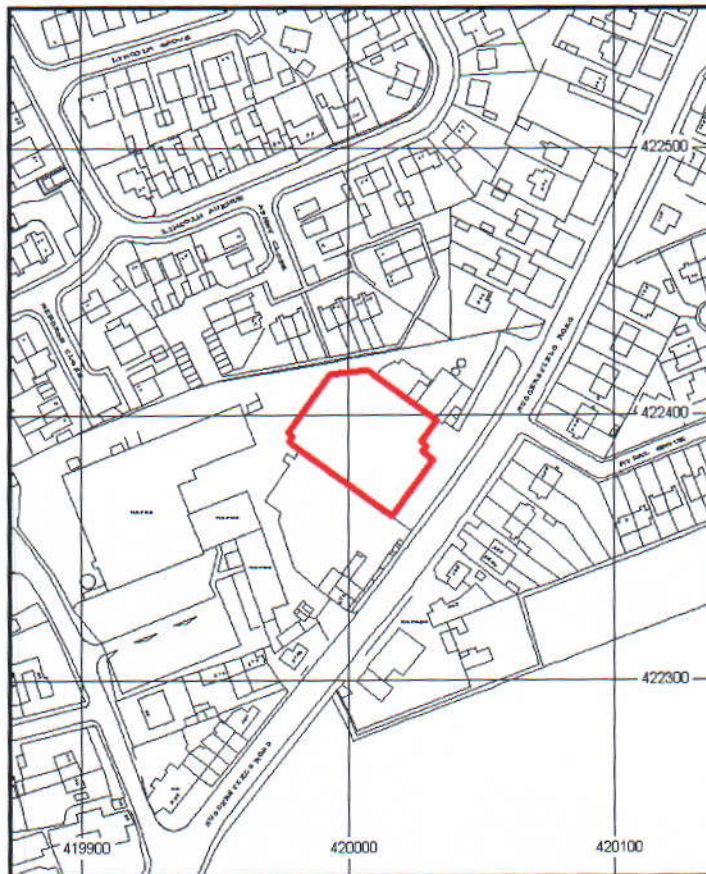


Enquiry boundary

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Key

Approximate position of enquiry boundary shown



Ashton



Bennett

Consultancy
Engineering Geologists and Environmental Scientists

APPENDIX B

PHOTOGRAPHS

THE FOUNTAIN WORKS, LIVERSEDGE. WHARFEDALE FINANCE COMPANY



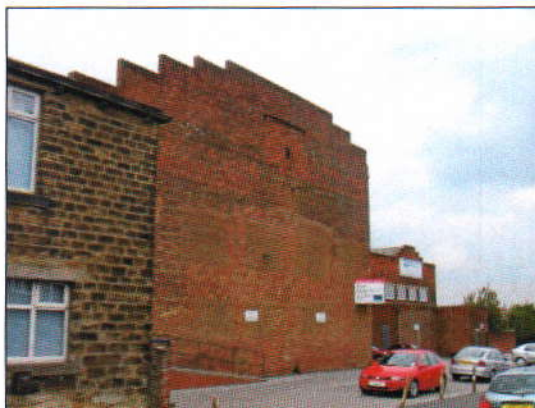
Front of the factory facing north west



Front of the factory with communal courtyard



View of factory roof seen from the east



Rear of factory facing Huddersfield Road