# 71 HOLLAND STREET, MILES PLATTING

# PHASE I DESK STUDY & PRELIMINARY RISK ASSESSMENT

Date: 10th February 2006

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# 1 INTRODUCTION

## 1.1 *Background*

Leyden Kirby Associates Ltd (LKA) has been commissioned by Hirschwood Homes to carry out a Phase I Desk Study for land at 71 Holland Street, Miles Platting. This detailed desk study is designed to investigate the site's history, geology and hydrogeology and to utilise this information to produce a contamination conceptual model of the site.

The site is located north of Holland Street at National Grid Reference 385830 399070 (see Figure 1) and is bounded to the north and east by park land and to the west by Bourdon Street. The Navigation Public House is situated to the northwest. The most recent use of the site is understood to be a warehouse with a vehicle maintenance garage located in the north-western part of the site. It is understood that the site is proposed to be redeveloped for a four storey residential block with associated car parking.

A historical desk study and associated contamination conceptual model are therefore required to identify potential liabilities associated with the site prior to its redevelopment and to support its application to the Local Authority Planning Department.

## 1.2 *Disclaimer*

This report has been prepared by LKA who have exercised such professional skill, care and diligence as may reasonably be expected of a properly qualified and competent consultant experienced in preparing reports of a similar scope.

However, to the extent that the report is based on or relies upon information contained in records, reports or other materials provided to LKA which have not been independently produced or verified, LKA gives no warranty, representation or assurance as to the accuracy or completeness of such information.

This report is prepared solely for the benefit of Hirschwood Homes. It may not be relied upon by any other party without the prior written consent of LKA. Those using this information in subsequent assessments or evaluations do so at their own risk.




**Figure 1: Location Plan, Land at Holland Street, Miles Platting**

**Date: 13th February 2006**

Leyden Kirby
ASSOCIATES LTD

# 2 SITE HISTORY

## 2.1 *Introduction*

In compiling this report, LKA consulted mapping and other environmental data provided by the Landmark Information Group. Copies of relevant historical plans are provided in Appendix A.

## 2.2 *1848 OS Mapping, Original Scale 1:10,560*

The study site is undeveloped. A pond is located adjacent to the western boundary 40m west-southwest of the study site. Several small buildings are located 20m northwest and 20m east of the study site.

A canal is identified 40m northwest of the study site. Shooters Brook is present 100m due south of the study site. Newton Brook is located 120m northwest of the study site. A brick field is located 120m northwest of the study site. Lloyd Field Cotton Mills are situated 140m due west of the study site. Newton Cottages are identified 130m northeast of the study site.

A large area of residential development is located southwest and west of the study site, the closest of which is 140m southwest and 240m due west of the study site. A rope walk is annotated 150m northeast of the study site. A chemical works is identified 300m northeast of the study site. A coal pit is located 350m northwest of the study site.

## 2.3 *1893 OS Mapping, Original Scale 1:2,500*

Several buildings occupy the southwestern corner of the study site. These buildings appear to be part of the Manchester Alum Works which encroaches onto the study site from the eastern and northern site boundaries. Holland Street is located adjacent to the southern site boundary. An unidentified street is located adjacent to the western boundary of the study site. The previously identified ponds adjacent to the western boundary and 70m southwest of the site are no longer present and appear to have been infilled.

Much residential development has occurred in the areas surrounding the study site, the closest of which are situated 50m due west and east; 10m southeast and 10m due south of the study site. The previously identified Shooters Brook south of the study site and Newton Brook north of the study site are no longer present and appear to have been culverted beneath the residential development. Alum Works with an associated tank are located 120m and 210m northeast of the study site respectively. The previously identified brick field northwest of the study site is no longer present and appears to have been infilled. Victoria Cotton Mill is identified 95m due north beyond the canal. Brook Chair Manufacturing Mill is present 100m due west.

## 2.4 *1894 / 1895 OS Mapping, Original Scale 1:10,560*

This edition is a composite of maps from 1894 to 1895.

Considering the map tile from 1894; there are no significant changes to the study site or surrounding areas from previous mapping.

2.5 *1908 OS Mapping, Original Scale 1:2,500*

The previously identified buildings in the southwestern corner of the study site have been remodelled into a single building. An iron foundry is identified 20m due west of the study site. The previously identified Alum Works northeast of the study site has now become part of the Manchester Alum Works. The previously identified tank 210m northeast of the study site is no longer present. Chimneys associated with the Manchester Alum Works are identified 50m north-northeast, 180m and 190m northeast of the study site respectively. Tanks associated with the Manchester Alum Works are also identified 80m northeast of the study site.

Albert Woollen Mill and associated chimney is now located adjacent to the Victoria Mills approximately 80m due north of the study site. An additional iron foundry is located 110m south-southeast of the study site.

2.6 *1909 OS Mapping, Original Scale 1:10,560*

There are no significant changes to the study site and surrounding area from previous mapping.

2.7 *1922 OS Mapping, Original Scale 1:2,500*

There are no significant changes to the study site from previous mapping. The previously identified iron foundry west of the study site is no longer present.

2.8 *1923 OS Mapping, Original Scale 1:10,560*

There are no significant changes to the study site and surrounding areas from previous mapping.

2.9 *1948 / 1949 OS Mapping, Original Scale 1:1,250*

This edition is a composite of maps from 1948 and 1949.

Considering the map tile from 1949; a chimney is now located in the centre of the study site. The previously identified Manchester Alum Works adjacent on the study site is now annotated as a scrap metal depot. A down and wadding factory is located adjacent to the eastern boundary of the study site. The previously identified street adjacent to the western site boundary is now annotated as Boundary Street.

The previously identified tanks northeast of the study site are no longer present. The northeastern part of the Manchester Alum Works has been redeveloped into a wire works, engineering works and aluminium works located 100m, 145m and 165m northeast of the study site respectively. Additional scrap metal depots are identified 80m due west and 60m due south of the study site. The previously identified Brook Chair Manufacturing Mill is now annotated as a cereal mill.

Several areas of residential development have been demolished 40m southeast; 30m south; 40m, 60m and 100m southwest and 90m northwest of the study site. A chimney associated with the Victoria Cotton Mill is located 195m north-northeast of the study site.

2.10 *1951 OS Mapping, Original Scale 1:2,500*

There are no significant changes to the study site and surrounding areas from previous mapping.

2.11 *1952 / 1953 / 1955 / 1956 OS Mapping, Original Scale 1:1,250*

This edition is a composite of maps from 1952 to 1956.

Considering the map tile from 1953; the previously identified chimney located in the centre of the study site is no longer present. Residential development has occurred 70m west-northwest of the study site.

2.12 *1953 / 1954 / 1958 / 1970 OS Mapping, Original Scale 1:2,500*

This edition is a composite of maps from 1953 to 1970.

Considering the map tile from 1954; the previously identified building associated with the scrap metal depot on and adjacent to the study site has been demolished.

2.13 *1956 OS Mapping, Original Scale 1:10,560*

There are no significant changes to the study site and surrounding area from previous mapping.

2.14 *1960 / 1963 / 1965 / 1968 / 1989 OS Mapping, Original Scale 1:1,250*

This edition is a composite of maps from 1960 to 1989.

Considering the map tile from 1965; an additional building is located in the northwestern corner of the study site and a chimney is once again present in the centre if the site. The previously identified scrap metal depot adjacent to the study site is now annotated as a depot.

A mill is identified 25m east-northeast of the study site. The previously identified wire works is now annotated as a works. The previously identified engineering works and aluminium works have been remodelled and are now annotated as being works. The previously identified scrap metal depot south of the study site is no longer present. A warehouse is located 55m due west of the study site. The previously identified scrap metal depot west of the study site is no longer present.

The previously identified Brook Mill west of the study site has been demolished and the area has been redevelopment for residential dwellings. Works are identified 160m due west and 210m west-southwest of the study site. The previously identified Albert Woollen Mill north of the study site is now annotated as a mill. The previously identified Victoria Mill is now annotated as a warehouse.

2.15 *1965 / 1966 OS Mapping, Original Scale 1:2,500*

This edition is a composite of maps from 1965 to 1966 and only refers to the study site and surrounding areas to the north, west and south.

Considering the map tile from 1966; there are no discernible changes to the study site or surrounding areas from previous mapping.

2.16 *1966 / 1968 OS Mapping, Original Scale 1:10,560*

This edition is a composite of maps from 1966 to 1968 and only refers to the study site and surrounding areas to the north, east and south.

Considering the map tile from 1968, there are no discernible changes to the study site or surrounding areas from previous mapping.

2.17 *1978 / 1979 / 1980 / 1984 OS Mapping, Original Scale 1:1,250*

This edition is a composite of maps from 1978 to 1984.

Considering the map tile from 1978; the previously identified mill north of the study site has been demolished. The previously identified works northeast of the study site have been demolished and the area has been redeveloped into St Mark's C of E Primary School and playing field.

2.18 *1972 / 1978 / 1979 / 1981 OS Mapping, Original Scale 1:10,000*

This edition is a composite of maps from 1972 to 1981.

Considering the map tile from 1981; there are no discernible changes to the study site or surrounding areas from previous mapping.

2.19 *1981 / 1983 / 1986 / 1991 OS Mapping, Original Scale 1:1,250*

This edition is a composite of maps from 1981 to 1991 and only refers to the study site and surrounding areas to the west, north and east.

Considering the map tile from 1981; the previously identified building occupying the study site is now annotated as a warehouse. The previously identified down and wadding factory adjacent to the eastern boundary is now annotated as a warehouse. The previously identified depot adjacent to the northern site boundary is now open land with marked pathways.

The previously identified mill east of the study site has been demolished and the area has been redeveloped into a warehouse. An area of residential development 180m west-northwest of the study site has been demolished. The canal north of the study site is now annotated as disused.

2.20 *1968 / 1970 / 1981 OS Mapping, Original Scale 1:1,250*

This edition is a composite of maps from 1968 to 1981.

Considering the map tile from 1981; there are no discernible changes to the study site or surrounding areas from previous mapping.

2.21 *1980 / 1982 / 1987 OS Mapping, Original Scale 1:10,000*

This edition is a composite of maps from 1980 to 1987.

Considering the map tile from 1987; there are no discernible changes to the study site or surrounding areas from previous mapping.

2.22 *1988 / 1989 OS Mapping, Original Scale 1:1,250*

This edition is a composite of maps from 1988 and 1989 and only refers to the study site and surrounding areas to the north, west and south.

Considering the map tile from 1988; the previously identified chimney in the centre of the study site is no longer present. The area to the north of the study site formerly occupied by Albert Mill is now an area of open land and a play area. The previously identified warehouse west of the study site is no longer present. Residential development has occurred 180m west-northwest of the study site. The previously identified warehouse northeast of the study site is no longer present.

2.23 *1992 OS Mapping, Original Scale 1:1,250*

There are no discernible changes to the study site or surrounding areas from previous mapping.

2.24 *1986 / 1990 / 1993 / 1994 OS Mapping, Original Scale 1:10,000*

This edition is a composite of maps from 1986 to 1994.

Considering the map tile from 1993; there are no discernible changes to the study site or surrounding areas from previous mapping.

2.25 *1999 OS Mapping, Original Scale 1:10,000*

There are no discernible changes to the study site or surrounding areas from previous mapping.

# 3 LANDFILL AND MINERAL SEARCH

A landfill and mineral search has been commissioned by LKA from Greater Manchester Geological Unit (GMGU). A full copy of the search is provided in Appendix B.

## 3.1 *Landfill Sites*

There are no known landfill sites within 250m of the study site. A review of historical Ordnance Survey mapping has identified four sites were landfill may potentially be present;

- Adjacent to the western site boundary, 40m due west and 230m north-northeast. Three ponds shown on mapping produced in 1853 are no longer present in mapping produced in 1893 suggesting they may have been infilled; and
- 130m northwest. Former brick field identified between 1853 and 1893.

## 3.2 *Mineral Sites*

There is one area within 250m of the study site where surface extraction of minerals has taken place;

- 130m northwest. Former brick field identified between 1853 and 1893. No further information is available.

GMGU records indicate that there has been extensive underground mining in the area and a number of coal seams are located to the north of the study site which could potentially extend beneath the study site. The nearest is the Openshaw Mine coal seam, mapped at rockhead 150m northeast of the study site (seam not proved). Assuming the distance is 150m and the dip of the strata is 28°, the depth of the Openshaw Mine coal seam beneath the study site is calculated at approximately 80m below the superficial glacial drift deposits. It is not known if this coal seam has been worked.

The nearest recorded / mapped mine shaft is approximately 350m northeast of the study site. Gleden Colliery is also shown approximately 450m due east of the study site.

# 4 SITE GEOLOGY, HYDROGEOLOGY AND HYDROLOGY

## 4.1 *Geology*

British Geological Survey digital data indicates that the drift deposits beneath the site comprise Glacial Till. These deposits will mainly consist of a firm to stiff clay interspersed with bands of sands and gravels.

Solid geological formations beneath the site are represented by the Carboniferous Upper Coal Measures Formation dipping 28° to the southwest. Drift deposits are shown as 8m thick in a borehole approximately 800m southeast of the study site.

## 4.2 *Hydrogeology*

The Environment Agency Groundwater Vulnerability Digital Data shows the site to be underlain by a minor aquifer (variably permeable), represented by the Upper Coal Measures which underlie the site. As the site is within an urban area a worst-case vulnerability classification (HU) is assumed for the soil classification above the minor aquifer. This represents soils with a high leaching potential with little ability to attenuate diffuse source pollutants and in which non-adsorbed diffuse source pollutants and liquid discharges have the potential to move rapidly to underlying strata or to shallow groundwater.

## 4.3 *Hydrology*

The nearest water course or surface water body is the Rochdale Canal which is located 40m northwest of the study site.

## 5 WALKOVER SURVEY

A walkover survey of the site was carried out on Friday 10th February 2006 and photographs are provided in Appendix C. The site was inaccessible; however a survey of the site boundary and the courtyard area was possible. The land to the north and east is occupied by undulating, undeveloped park land with the Navigation Public House located to the northeast. The land on the opposite site of Holland Street is occupied by residential dwellings.

The site is currently occupied by a three storey derelict building with a courtyard/ access in the eastern part of the study site. The survey around the perimeter of the study site showed that the existing brick building was in poor condition. The main building on site was noted to be derelict with many of the windows boarded. The boundary walls to the east and north were edged with corrugated iron fencing.

The view from the north of the site proved the presence of the chimney stack which had been partly removed. The northwestern part of the study site was occupied by a single storey building, believed to be the maintenance garage, understood to still be active.

The courtyard area (in the north and east of the study site) makes up the access to the rear garage building and is gated on the southeastern site boundary. At the time of the site visit this area of the site was occupied by used gas canisters and old tyres. A brief inspection of the ground surface showed made ground to be present. This appeared to be ashy, with brick fragments present on the surface. No visual or olfactory evidence of hydrocarbon contamination was encountered during the site walkover.

# 6 CONTAMINATION CONCEPTUAL MODEL

## 6.1 *Introduction*

The aim of the conceptual model is to provide a preliminary assessment of the likelihood of a pollutant linkage for each potential combination of contaminant, pathway and receptor. The conceptual model can then be used to make an informed decision on the contamination risks associated with the site and whether an intrusive site investigation of the site is required.

The sections below are therefore divided into potential hazards, potential receptors and potential pathways. The final section provides an assessment of the potential pollutant linkages that may be present on the site if redevelopment were to occur.

## 6.2 *Potential Hazards*

The southwestern corner of the study site has been occupied by buildings since 1893 and by 1908 had been remodelled into a single building. These buildings appeared to part of Manchester Alum Works which encroached onto the study site between until 1949 when the western part of the alum works became a scrap metal depot. A chimney was identified in the centre of the study site between 1949 and 1953. Additional buildings and a chimney were present on site from 1965. By 1981 the building in the southwestern corner of the site was annotated as a warehouse. It is understood that a small garage has recently been erected at the rear of the existing building that is used for storing and repairing vehicles.

The immediate surrounding areas have been occupied by residential development however several industrial processes have been located within 250m of the study site including cotton and woollen mills, wire works, engineering works, alum works, aluminium works and scrap metal depots.

If contaminants are present on the study site they may be associated with the sites and surrounding areas previous uses. Any made ground or waste materials present on the site may have been sourced from on site activities and the surrounding land uses. Potential contaminants that may be present therefore include ash and clinker (containing heavy metals such as arsenic and PAHs such as benzo(a)pyrene) that may have been spread across the site during the sites use as an alum works.

As the site was previously used as alum works associated contaminants include sulphuric acid, alkalis, heavy metals, PAH and iron pyrite. Other contaminants include acids, fuel and lubricating oils, asbestos, paints, polychlorinated biphenyls (PCBs) and phenols may also be present on site from the scrap metal depot. Atmospheric fallout from on site and nearby chimneys may contribute to heavy metals and PAH contamination. Diesel and Petrol Range Organics (DRO and PRO), VOCs and Benzene, Toluene, Ethylbenzene and Xylene contaminants (BTEX) may also be present on the surface and at depth associated with the garage currently situated on the study site.

There are no known landfill sites within 250m of the study site however there are four areas which have been infilled where landfill may potentially be present. These areas may be a source of landfill gases such as methane and carbon dioxide and may be present on or have migrated onto the study site.

### 6.3 *Potential Receptors*

Potential receptors with respect to human health and hazards present on the site include users of the proposed development, future site construction workers and residents of nearby commercial and residential dwellings. Depending on the nature and concentration of the potential contaminants, the underlying minor aquifer and canal may also be considered as potential receptors. The fabric of proposed buildings and building materials are also considered to be potential receptors.

### 6.4 *Potential Pathways*

The pathways by which the receptors could be exposed to the potential hazards present are through dermal contact, inhalation or ingestion of contaminated soils or dust, vapour migration through the sub-surface geology, sub-surface permeation through, and attack of, building materials and services and exposure to tainted potable water supplies.

### 6.5 *Contamination Conceptual Model*

The conceptual model for the Holland Street site is shown in Table 6-1. Pollutant linkages 1 to 3 between the anticipated heavy metals and organic compounds and the future site residents and nearby residents are all considered to be possible.

Potential pollutant linkage 4, between landfill gas potentially present on the site and the future site users and nearby site residents is also considered possible as is potential pollutant linkage 5 between the identified contaminants and the underlying minor aquifer and nearby canal.

Potential pollutant linkage 6 refers to the potential deleterious effects that sulphate, organic compounds and landfill gas may have on building materials such as concrete, water pipes and building structures. This pollutant linkage is also considered possible.

Potential pollutant linkage 7 refers to the potential contaminants permeating potable water pipes and consumption by the future users of the tainted water supply. This pollutant linkage is also considered possible.

Potential pollutant linkage 8 refers to the potential phytoxic contaminants restricting plant and tree growth in any future soft landscaping on the study site. This pollutant linkage is also considered possible.

| Pollutant Linkage No. | Hazards | | | | Pathway | Receptor |
|---|---|---|---|---|---|---|
| | Landfill Gas | Heavy Metals | Asbestos | Organic Compounds | | |
| 1 | x | ? | ? | ? | Dermal Contact, ingestion and inhalation of contaminated soil and dust | Future residents of the development |
| 2 | x | ? | ? | ? | Dermal Contact, ingestion and inhalation of contaminated soil and dust | Future site workers |
| 3 | x | ? | ? | ? | Ingestion and inhalation of contaminated soil and dust | Nearby residents and workers |
| 4 | ? | x | X | ? | Vapour Migration | Site occupants, future workers |
| 5 | x | ? | X | ? | Groundwater migration to underlying aquifer | Minor Aquifer & canal |
| 6 | x | ? | X | ? | Contact with potential hazards | Site Buildings |
| 7 | x | ? | x | ? | Ingestion of tainted water supply | Future site residents |
| 8 | x | ? | x | ? | Uptake of contaminants | Future landscaping |

Table 6-1: Contamination conceptual model for the Holland Street site
(Key: ? – pollutant linkage possible; x – pollutant linkage unlikely)

# 7 CONCLUSIONS

Leyden Kirby Associates Ltd (LKA) has been commissioned by Hirschwood Homes to carry out a Phase I Desk Study for land at 71 Holland Street, Miles Platting. This detailed desk study is designed to investigate the site's history, geology and hydrogeology and to utilise this information to produce a contamination conceptual model of the site.

British Geological Survey (BGS) data indicates that the drift deposits beneath the site comprise Glacial Till. Solid geological formations beneath the site are represented by Upper Coal Measures. The Environment Agency Groundwater Vulnerability Digital Data shows the site to be underlain by a minor aquifer (variably permeable), represented by the Upper Coal Measures which underlie the site.

The southwestern corner of the study site has been occupied by buildings since 1893 and by 1908 had been remodelled into a single building. These buildings appeared to part of Manchester Alum Works which encroached onto the study site between until 1949 when the alum works became a scrap metal depot. A chimney was identified in the centre of the study site between 1949 and 1953. Additional buildings and a chimney were present on site from 1965. By 1981 the building in the southwestern corner of the site was annotated as a warehouse. It is understood that a small garage has recently been erected at the rear of the existing building that is used for storing and repairing vehicles.

The immediate surrounding areas have been occupied by residential development however several industrial processes have been located within 250m of the study site including cotton and woollen mills, wire works, engineering works, alum works, aluminium works and scrap metal depots. There are no known landfill sites within 250m of the study site however there are four areas which have been infilled where landfill may potentially be present.

Potential contaminants that may be present on site include organic compounds, heavy metals, TPH, PAH, waste materials such as ash and clinker (containing heavy metals such as arsenic and PAHs such as benzo(a)pyrene) that may have been spread across the site during the sites former use as alum works. Other contaminants associated with the alum works include sulphuric acids, alkalis, iron pyrite and heavy metals. Due to the sites use as a scrap metal depot additional contaminants could include asbestos, acids, fuel and lubricating oils, PCBs, paints and phenols. A garage is currently situated on the study site which is used for the storage and repair of vehicles, therefore DRO, PRO, VOCs and BTEX may also be present on the surface and at depth.

There are no known landfill sites within 250m of the study site however there are four areas which have been infilled where landfill may potentially be present. These areas may be a source of landfill gases such as methane and carbon dioxide and may be present on or have migrated onto the study site.

A contamination conceptual model has been developed and identified eight potential pollutant linkages. Each potential pollutant linkage identified in the conceptual model is considered to be possible and an investigation is required to ensure that the risk associated with each of these linkages is adequately characterised and assessed.

# 8 RECOMMENDATIONS

It is recommended that to support any future planning applications for this development, a Phase II intrusive survey is carried out across the site to investigate the seven identified potential pollutant linkages further.

This investigation should be designed in line with BS:10175 with a 20m spacing between sampling locations. To address potential pollutant linkages 1, 2, 3, 6, 7 and 8 solid samples should be collected from each trial pit or borehole and sent away for appropriate chemical analyses based upon the potential hazards identified in Section 6. This investigation technique will delineate areas of potential contamination and identify and characterise any contaminants encountered.

Potential pollutant linkage 4 is via vapour migration from ground gas into the proposed building. The gas hazards for this linkage have been assumed due to the site's predominantly urban location and areas of likely infilling in the surrounding areas. It is therefore recommended that boreholes are sunk on the site and are instrumented with monitoring standpipes to allow for monitoring of landfill gases (carbon dioxide, methane, oxygen and any appropriate VOC vapours). The standpipes may also be utilised to collect groundwater samples as appropriate to assess the risk to the canal and minor aquifer as part of potential pollutant linkage 5.

Boreholes that may be sunk on site can also be utilised to provide appropriate geotechnical information on sub-surface conditions.

This investigation, in conjunction with appropriate geotechnical testing, will delineate any existing areas of potential contamination and identify and characterise any contaminants encountered. Information from this investigation can then be used to provide a more detailed assessment of the identified pollutant linkages provide appropriate foundation solutions and, if necessary, identify appropriate remedial techniques to ensure that the site is made suitable for its proposed end use.

# APPENDIX A

# HISTORICAL MAPS

# APPENDIX B

# LANDFILL AND MINERAL SEARCH

GMGU

Geotechnics • Environment • Planning

**Director: Simon Talbot,**
BSc, MSc, FGS, CEng, MIMMM

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Rebecca McKellar
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Kay Street
Bury BL9 6BU

Our Ref: 5083co1
Contact: catherine.o'donnell@gmgu.org.uk
Your Ref:n/a

Date:7th February 2006

Dear Rebecca,

## Subject: 71 Holland Street, Miles Platting - Landfill and Mineral search

Thank you for requesting the above. The site (edged black) and a line 250m from its boundary is shown on the enclosed 1:5,000 scale plan.

### LANDFILL SITES:

GMGU records show there are no registered/known landfill sites within 250m of the site.

Historical mapping has identified four sites where landfill may potentially be present (approximate locations shown on the enclosed plan). First edition mapping (date 1853) shows three ponds and a brick field. The features are not present on the second edition of mapping (dated 1893) suggesting they may have been infilled.

### MINERAL SITES:

BGS digital data maps the drift at the site as glacial till (plan enclosed). The solid geology is mapped as the Carboniferous Upper Coal Measures Formation (UCM) (plan enclosed). BGS Lancs sheet 104NE dated 1923, scale 1:10,560 and BGS SJ89NE dated 1976, scale 1:10,560 show the strata dipping at 28° to the southwest. Drift is shown as 8m thick in a borehole ~800m to the southeast. An extract from BGS SJ89NE dated 1976, scale 1:10,560 is enclosed.

GMGU records indicate there is one site within 250m of the site where surface extraction of minerals has taken place. A brick field is shown on first edition of mapping (dated 1853).

GMGU records show there is extensive underground mining in the area, which could potentially extend beneath the site.

GMGU records show there are a number of coal seams to the north of the site which may extend beneath the site. The nearest is Openshaw Mine coal seam, mapped at rockhead 150m to the northeast of the site (seam not proved). Assuming the distance is 150m and the dip of the strata is 28°, the depth of the Openshaw Mine coal seam beneath the site will be approximately 80m (below the drift). It is not known if this coal seam has been worked.

GMGU records show the nearest recorded/mapped mine shaft is approximately 350m to the northeast of the site. Gleden Colliery is also shown approximately 450m to the east of the site.

GMGU does not hold any records for pending or recently approved landfill or mineral planning applications within the search area.

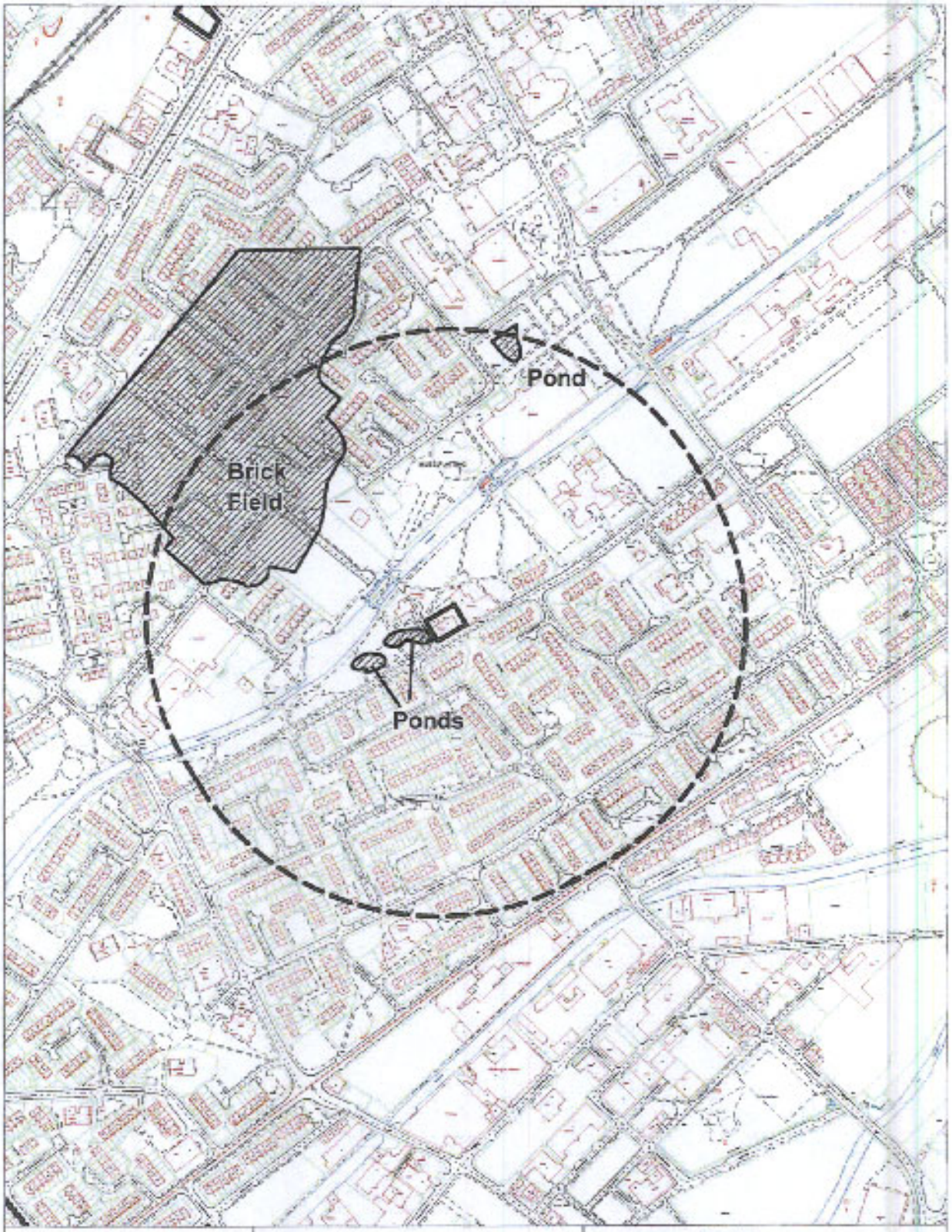
Other landfills and mineral sites may exist for which the GMGU has no records.

This information is provided at a cost of £110.00 + VAT. An invoice will be issued shortly.

Yours sincerely



Catherine O'Donnell
Geologist (Assistant)




**GMGU**

Room 2.22
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Tel: 0161 275 7150
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Email: gmgu@gmgu.org.uk

**Title:**

**Landfill, mineral and mining within 250m of site at 71 Holland Street, Miles Platting.**

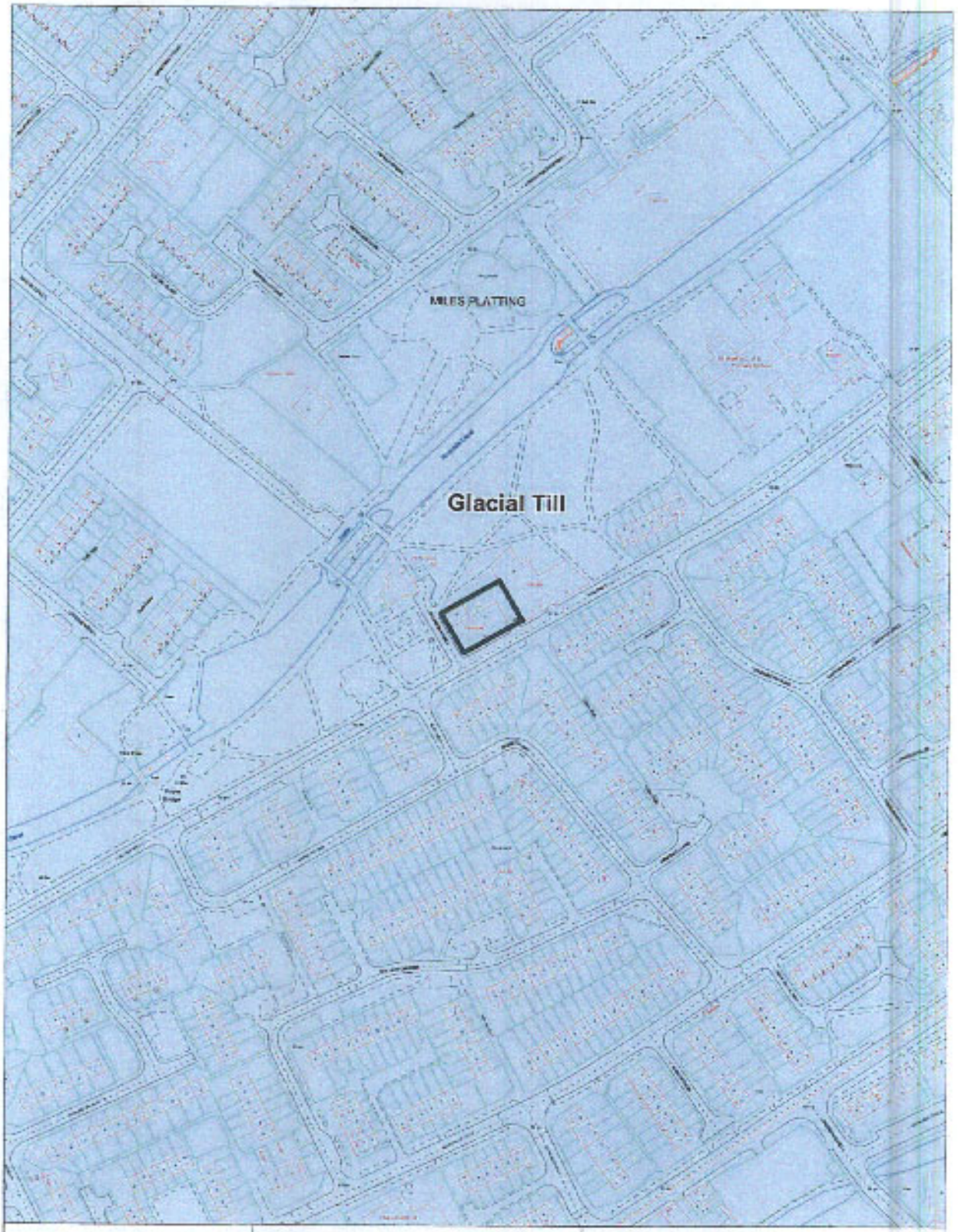
**Date: 7/02/06**

**Scale: 1:5000**

**Client: Leyden Kirby**

**Job Ref: 5083**

PRODUCED FROM THE ORDNANCE SURVEY MAP WITH THE PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONERY OFFICE CROWN COPYRIGHT RESERVED




**GMGU**

Room 2.22
Williamson Building
University of Manchester
Oxford Rd
M13 9PL

Tel: 0161 275 7150
Fax: 0161 275 7151
Email: gmgu@gmgu.org.uk

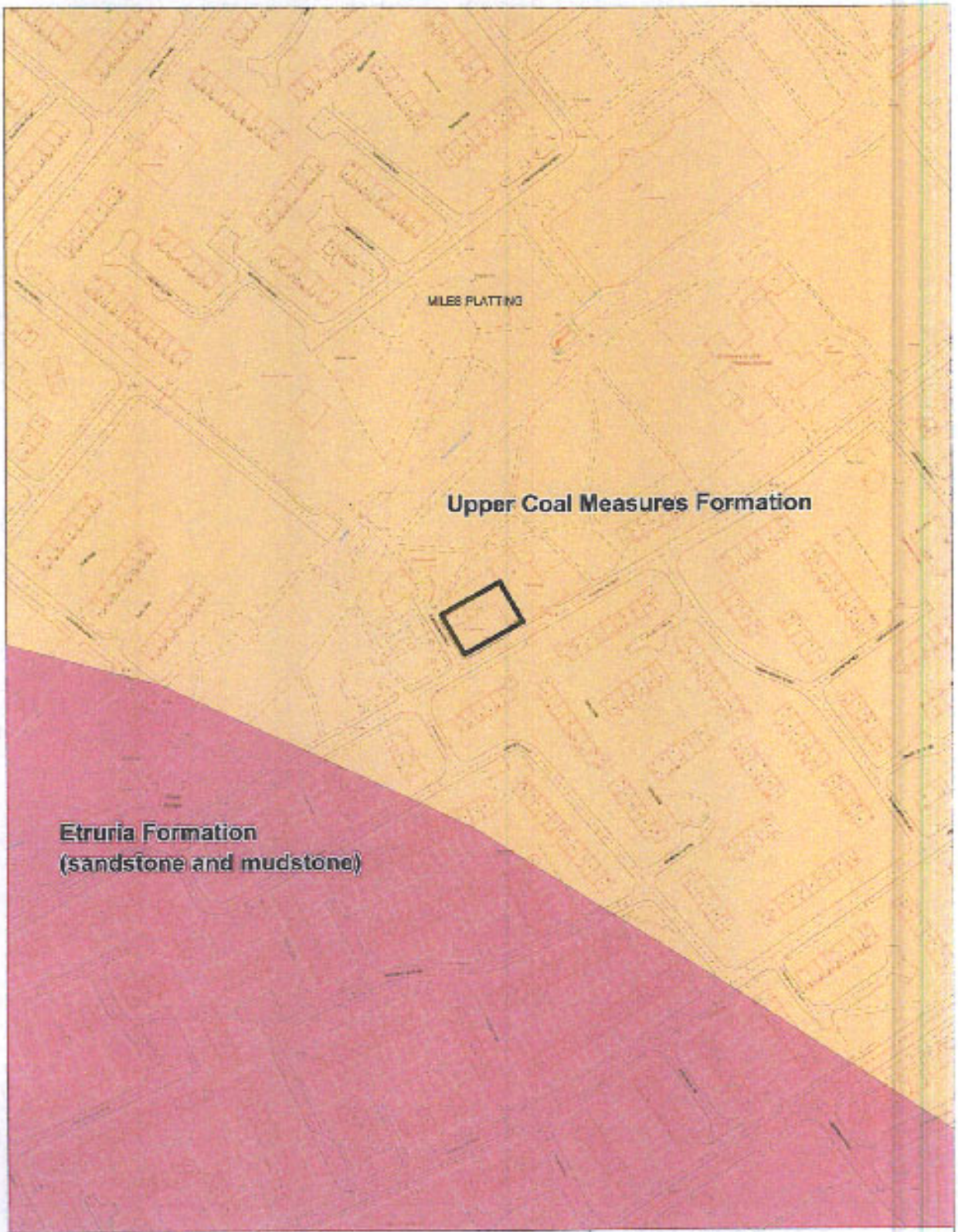
**Title:**

**Drift Geology**

**71 Holland Street, Miles Platting.**

**Date: 7/02/06**
**Scale: 1:2500**
**Client: Leyden Kirby**
**Job Ref: 5083**

PRODUCED FROM THE ORDNANCE SURVEY MAP WITH THE PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONERY OFFICE CROWN COPYRIGHT RESERVED

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**Title:**

**Solid Geology**

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**Date: 7/02/06**
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**Job Ref: 5083**

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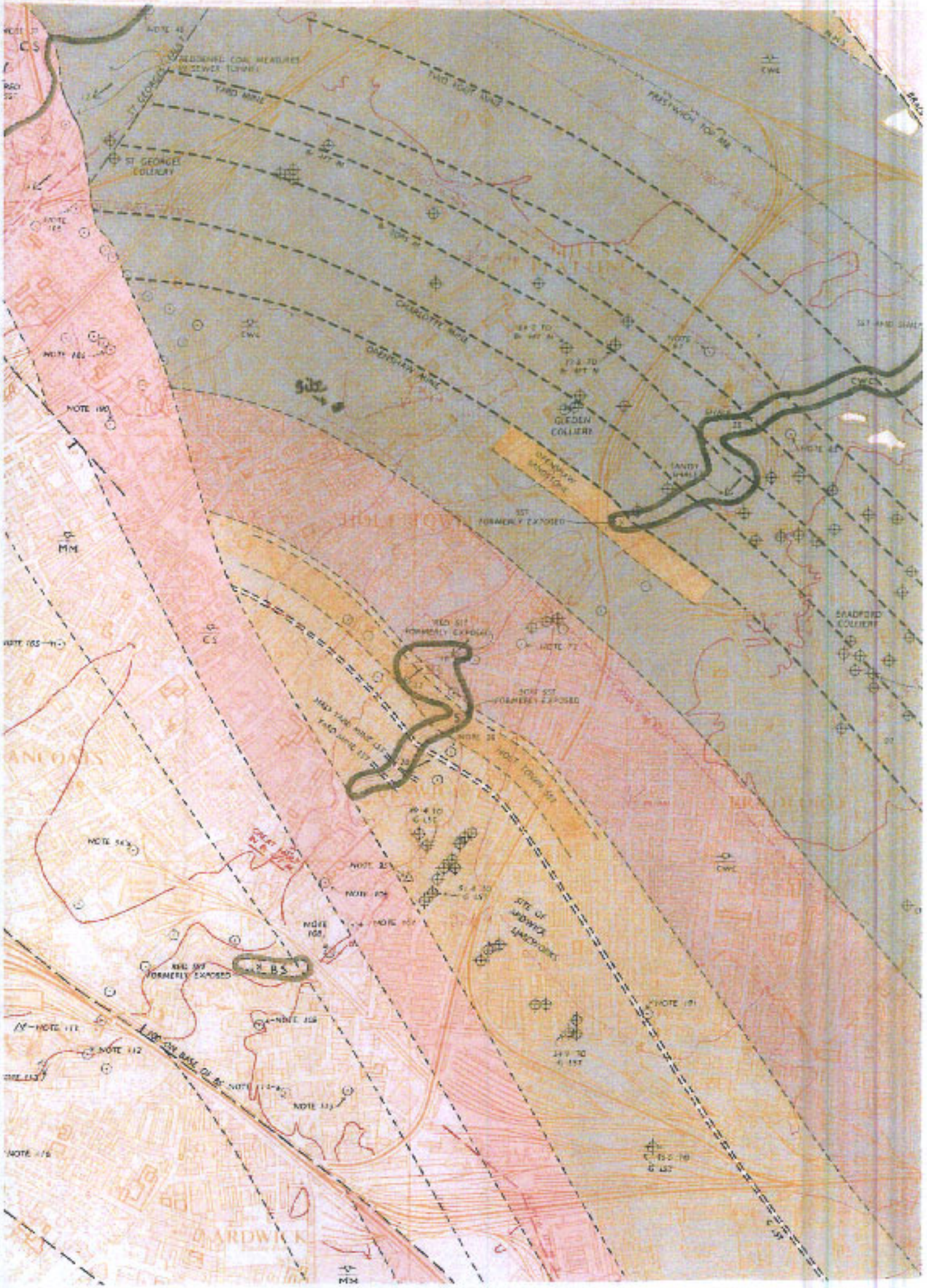
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# APPENDIX C

# PHOTOGRAPHS



**Photograph 1.** View of 71 Holland Street from southwest.



**Photograph 2.** View of the rear of 71 Holland Street from northwest. Showing garage building at front right and former chimney stack



**Photograph 3**. View of access to single storey garage building in northwestern are of the site, also showing groundcover comprising of made ground gravel and remnants of cobbles.



**Photograph 4**. View of eastern are of site, from northern site boundary, showing presence of used gas canisters and old tyres.