

**PHASE I
GEO-ENVIRONMENTAL SITE ASSESSMENT**

**Land at Ellis Ashton Street,
Huyton
Merseyside**

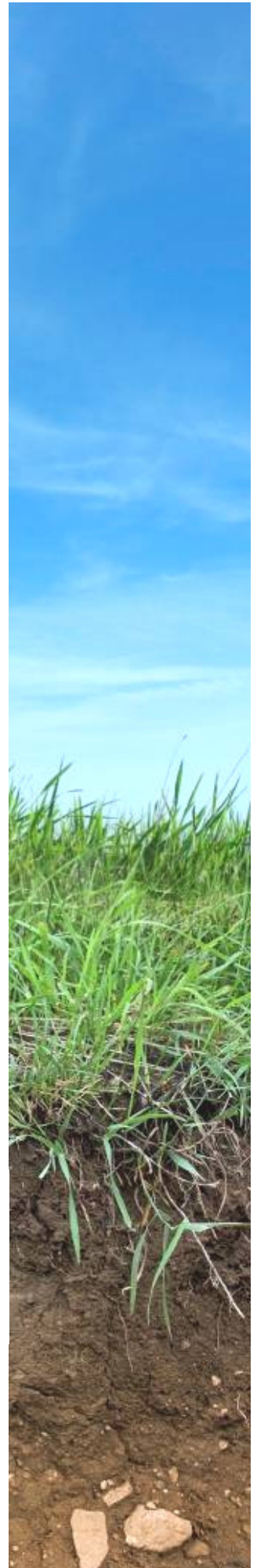
**REC Report: 43938p1r0
Issued: March 2011**

Prepared for

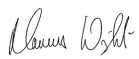
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QUALITY ASSURANCE

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Prepared by	M. Daily			
Signature				
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Authorised by	A Edgar			
Signature				
Project number	43938			

EXECUTIVE SUMMARY

The site was formerly associated with printing and inks, and was operated by BASF. The site is currently unoccupied and in the process of having the larger building demolished. The footprint of the old building and its existing concrete floor will then be used to construct a timber curing building that will be roofed and have vented side cladding. The venting means the building is not capable of retaining and confining gas or vapour.

Site personnel will work out of existing offices located next to the site entrance on the southern boundary. The proposed use represents a fire risk but there are plans to have significant damping capability to mitigate any possible impacts, using the existing fire suppression system installed by BASF.

Historical Development

Historical Ordnance Survey maps from 1850 show that the site was undeveloped, after which the site was partly occupied by an iron works until after 1927, a timber yard until after 1966 and a printing ink factory after 1968 to present day.

Several factories and industrial activities situated within 250m of the site are shown on maps from 1950s onwards, including an electric lamp works, saw mill, cable works, council depot and refuse destructor. A number of shafts and collieries are shown maps from 1850 within 250m of the site, although these are shown as being disused by the 1900s. Landfilling activities are indicated to the north and west of the site in the 1950s to the 1970s.

Environmental Setting

The site is considered to be situated in a low to moderately sensitive environmental setting as Longwood Mill Brook is located 55m to the east. The surrounding properties are all industrial and the underlying strata are classified as a Secondary A aquifer, though these may be afforded protection by the presence of low permeability Glacial Till.

Conceptual Site Model

Minor sources such as a transformer and asbestos containing roofing will not generate a risk to human health provided due care is exercised during any handling. The location of any solvent stores has not been confirmed but there are no new planned enclosed buildings within which any human exposure could be a concern. The same applies for ground gas since the new building will be vented and not sealed.

There are no significant aquifers beneath the site and no new reports of impact to the Brook. The long term risk to controlled waters from the site is therefore considered negligible.

Conclusion

Based on the proposed end use and environmental setting, the site is considered to represent a **low/moderate** risk in terms of contaminated land liabilities.

Recommendations

Site investigation works are not considered necessary at this time. Should site use change or new occupied structures be planned then a site investigation is likely to be required.

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Appendix V	CD containing historical maps, environmental data, report and photographs.

1.0 INTRODUCTION

1.1 Background

Resource and Environmental Consultants Ltd (REC) have been commissioned by Wareing Buildings to undertake a Phase I GeoEnvironmental Site Assessment of land at Ellis Ashton Road, Huyton. The site location is shown in Appendix II.

The report is required to determine potential contaminated land liabilities associated with the freehold interests of the property. The report assumes a continued commercial/industrial use.

1.2 Proposed End Use

The site will be used as a vented storage building for maturing hard wood timber with separate offices in existing buildings. The development will occupy the same building footprint as the previous occupants, with the concrete slab retained. The new structure will be a vented-to-atmosphere, steel framed and metal clad unit.

1.2 Objectives

The objectives of the desk based study are to:

- Review historical plans, geology, hydrogeology, site sensitivity, flood-plain issues, mining records and any local authority information available in order to complete a Desk Study in line with CLR11;
- Assess the implications of any potential environmental risks, liabilities and development constraints associated with the site in relation to the future use of the site and in relation to off-site receptors; and,
- Provide a factual and interpretative report relating to the desk study and provide preliminary recommendations on any potential development issues.

1.3 Sources of Information

Background information was sought from the following sources:

- Envirocheck Database Search;
- Historical mapping dated 1850 to 2010. A selection of historical maps are reproduced in Appendix III;
- Environment Agency Groundwater Vulnerability Map (www.environment-agency.gov.uk/wiyby);
- Radon: Guidance on protective measures for new buildings (BRE Document BR 211, 2007); and,
- British Geological Survey Map (Sheet 97, 1:50,000 Runcorn, Solid & Drift edition).

1.4 Risk Classification

REC Ltd has utilised the available data to classify the site on the basis of its likely environmental risk and in particular contaminated land liability in relation to the property transaction. The risk classification definitions are summarised below:

Risk	Definition
Low	There are unlikely to be significant contaminated land liabilities associated with the property.
Low-Moderate	There are unlikely to be significant contaminated land liabilities associated with the property with regard to the proposed use. However, minor issues may require further consideration in the event of a future redevelopment of the site etc.
Moderate	Some potential contaminated land liabilities are likely to affect the property as a result of historical and/or current activities. The risks identified are unlikely to pose an immediate significant issue but the purchaser may wish to make further enquiries of the vendor or undertake further environmental improvements. Redevelopment of the site will likely require further site investigation.
Moderate-High	Some potentially significant contaminated land liabilities have been identified at the property that requires further assessment including intrusive ground investigations.
High	Significant potential contaminated land liabilities have been identified at the property. Further assessment including intrusive ground investigation will be required to determine to level of risk and associated liability.

1.5 Limitations of the Study

The limitations of this report are presented in Appendix I.

2.0 SITE SETTING

2.1 Site Details

Site Address	Land at Ellis Ashton Street, Huyton, Merseyside L36 6BN
National Grid Reference	345790, 390350
Site Area	1.81 Ha

A site location map is presented in Appendix II.

2.2 Current Site Use

Site Description

Demolition of buildings is currently underway. This includes the removal of at least 5 large vertical tanks which have been set aside. The photographs, presented in Appendix IV, were taken during the demolition process and indicate the structures that will be retained on-site. The main building has been demolished as well as a small unit to its immediate north. The final site layout before demolition consisted of two large buildings fronting Ellis Ashton Street; one was the former plant building while the eastern building contained some storage and offices. The latter building has been retained.

To the rear of the site along the northern boundary from east to west are:

- A fire water tank adjacent to an open sided, potentially asbestos cement roofed building to the east;
- A small wash down hut adjacent to garages;
- Transformer and possible sub-station;
- Another service building (raised elevation) with a small laboratory type building on its west end;
- In front of the raised building is a large open wash down area with a sump in one corner; and
- Switch buildings to the west.

There are several smaller buildings along the western boundary that have been demolished. Parking takes up much of the eastern side of the site and the access road runs from the southeast, in front of the northern buildings and around to the western side. All other areas of the site are covered by block paving or concrete hard standing. The topography of the site is level at the building footings, but then sloping towards the centre of the parking area and the east.

2.3 Surrounding Area

The surrounding land uses are summarised below:

Direction	Land Use
North	Stadt Moors Park
East	Unoccupied woodland reportedly also owned by the former occupants BASF, and now owned by Hardwood Timber Sales. Immediately east of this undeveloped land is the M57.
South	Commercial/industrial properties across Ellis Aston Street.
West	Commercial Industrial properties

3.0 SITE HISTORY

3.1 Historical Development

A review of historical Ordnance Survey maps and information pertinent to the site and within a 250m radius is summarised below in Table 3.1.

Table 3.1 Summary of Potentially Contaminative Historical Land Uses

Map Edition	Historical Land Use	
	On Site	Off Site
1850 (10,560)	The site is open, undeveloped land. A pond is situated in the centre of the site.	A <i>Railway To Collieries</i> is shown running along to northern site boundary. A number of coal mining features are shown within 250m: Tom Hey Pit, 100m west; Huyton Hey Colliery, 100m northeast; Ridings Colliery, 200m northeast; Wherton Colliery 250m east.
1892 (1:2,500)	A pond and area of raised land associated with the Iron Works are shown in the northwestern area of the site.	An iron works is shown 25m west of the site. An <i>Old Shaft</i> is shown 175m north of the site.
1907 (1:2,500)	Structures forming part of the adjacent iron works are shown in the northwest corner region of the site.	Railway sidings are shown associated with the Iron Works. An electric lamp works is shown 250m west of the site.
1927 (1:2,500)	The structures on the site are no longer shown.	The iron works is no longer shown.
1937 (1:2,500)	No significant changes.	No significant changes.
1956	No significant changes.	Northeast of the site possibly up to the extending down to the northeastern tip of the site, marsh/shallow excavation areas (possible sand quarrying from 1951) are now shown as a refuse dump.
1957 – 1959 (1:2,500)	The northern half of the site has been raised and is marked as a Timber Yard. Two ponds are no longer shown and presumed backfilled.	The level of land to the north of the adjacent mineral railway, extending to more than 250m north, is shown as being raised and two ponds are shown to have been backfilled. A saw mill and a cable works are shown 40m west and 150m west of the site respectively, with associated tanks and an electricity sub-station. A vacuum flask and switch factory are shown 250m southwest. An area of raised land is shown 150m west of the site.
1965	No significant change.	The limited excavation to the northeast now extends several hundred metres and is

Map Edition	Historical Land Use	
	On Site	Off Site
		referred to as disused opencast workings. The surface spoil appears to have been mounded along the site's northern boundary.
1970 (1:2,500)	A printing ink factory is shown on the site with a row of tanks shown along the western site boundary and a tank in the centre of the site. Two ponds are no longer shown and are presumed to have been backfilled.	The saw mill has been replaced by a UDC Depot and now extends to being adjacent to the site. A toughened glass factory, bakery and manufacturing veterinary chemists are shown 75m west, 125m south and 150m southwest of the site respectively.
1980 – 1988 (1:1,250)	The factory has been extended with additional associated structures shown on the site, with a tank located in the central northern area of the site	A refuse destructor and associated tank are shown 40m south of the site. An unspecified works with associated tanks and electricity substation are shown 100m east of the site. The M57 motorway is shown 100m east of the site, east of which the land is marked as a refuse tip.
1993 (1:1,250)	The site is shown in its present day configuration.	The railway north of the site is no longer shown.
2010 (1:10,000)	No significant changes.	The land north of the site is marked as Stadt Moers Park.

4.0 ENVIRONMENTAL SETTING

4.1 Geology & Hydrogeology

The British Geological Survey (BGS) map for the site, (Sheet 97, 1:50,000 Runcorn), Solid & Drift edition) indicates that the site is underlain by the following geological sequence:

Geological Unit	Classification	Description	Aquifer Classification
Drift	Devensian Till	Boulder Clay	Unproductive strata
Solid	Pennine Middle Coal Measures	Sandstones, Siltstones, Mudstones	Secondary A

The Envirocheck report indicates one groundwater abstraction within 1.0km radius of the site located 250m northwest and used for cooling purposes. The site is not located within a groundwater Source Protection Zone.

4.2 Geotechnical Data

Geotechnical Data presented within the Envirocheck report identifies the following ground conditions:

Hazard	Designation
Coal Mining	In an area which may be affected by coal mining activity.
Collapsible Ground	No Hazard.
Compressible Ground	No Hazard.
Ground Dissolution	No Hazard.
Landslide	Very Low Hazard.
Running Sand	Very Low Hazard.
Swelling / Shrinking Clay	Very Low Hazard.

4.3 Coal Mining

The site is in an area which may be affected by coal mining and therefore a Coal Authority Coal Mining Report should be obtained in the event that any construction takes place beyond the existing footprint of the demolished building onto which the new structure will be placed, remembering that the existing concrete floor has been retained.

4.4 Hydrology

Logwood Mill Brook, which passes 55m southeast of the developed site and is adjacent to the undeveloped land to the southeast also owned by Hardwood Timber Sales Limited, is the closest surface watercourse to the site and flows from north to south.

The site is not recorded as being within an EA defined flood risk zone.

4.5 Radon Risk Potential

The Envirocheck Report indicates the site is situated in an area where less than 1% of homes are above the Action Level and that the BGS reports that full radon protective measures are not necessary in the construction of new dwellings or extensions.

4.6 Industrial Land Uses

The site has historically been subject to several industrial land uses, including an iron works, a timber yard and a printing ink factory.

The site is situated within a largely commercial and industrial area and as such there are a numerous entries within the Trade Directory. The closest relates to a freight hauliers located 5m south of the site and there are 15 additional entries relating to activities within 250m of the site.

4.7 Sensitive Land Uses

Stadt Moers Park is situated adjacent to the north of the site and the closest residential properties are located approximately 150m northwest of the site.

An area of Adopted Green Belt is located 10m north of the site.

4.8 Site Sensitivity Assessment

The site is considered to be located within a low to moderate sensitivity setting due to the following reasons:

- The underlying strata are classified as Unproductive strata underlain by a Secondary A aquifer;
- Logwood Mill Brook passes 55m southeast of the site to be developed and adjacent to the undeveloped land which is also owned by Hardwood;
- The site is located within an area of mainly commercial and industrial land use and residential properties are located in 150m to the northwest. Stadt Moers Park is situated adjacent to the north of the site and the closest residential properties are located approximately 150m northwest of the site;
- There is a waste handling site across Ashton Ellis Street to the southwest and registered landfills to the northwest and beyond the M57 to the east. The site listed as a refuse dump in 1956 and its surroundings, formerly the disused workings, are not listed as landfill.

5.0 CONSULTATIONS

5.1 Landfill Sites and Waste Treatment Sites

A number of landfill sites can be identified in the Envirocheck Report within 250m of the site. The known details are summarised below along with other waste management facilities.

Site Name	Location	Waste Types Accepted	Dates operated
Historical Landfill Site			
West View Tip	145m north	No data.	No data
Tushingham Tip	150m east	No data.	No data
Historical Landfill Site			
Tushingham Metallic Brick Works	15m southwest	Deposited waste included inert waste.	No data
West View Tip	70m northwest	No data.	January 1971 – January 1978
Coalgate Lane Landfill Site	150 east	Deposited waste included inert, industrial, commercial, household waste and liquid sludge.	January 1972 – January 1983
Huyton Quarry	175m east	No data.	October 1971 – unknown date.
Licensed Waste Management Facilities			
Land at Ashton Ellis Street	75m south	Household, commercial and industrial station.	September 1995 – unknown date
Land at Stretton Way	190m south	No data.	May 2007 – unknown date.
Local Authority Landfill Sites			
West View Tip	60m northwest	Roadworks spoil.	Closed December 1989
Paradise Lane	155m east	No data.	No data
Coalgate Lane	155m east	No data.	No data
Coalgate Lane	155m east	No data.	No data
Breckfields	160m west	No data.	No data
Brickfields	170m west	Putrescible.	No data
Huyton Quarry	244m northwest	No data.	No data

Site Name	Location	Waste Types Accepted	Dates operated
Registered Waste Transfer Sites			
Huyton Waste Transfer Station	70m south	Household, commercial and industrial waste.	Superseded May 1991
Coalgate Lane	220m east	Household waste, waste oils.	Defunct January 1998

5.3 Regulatory Database

The following information has been obtained from a commercially available environmental database. The summary Table 5.1 only includes records not otherwise detailed in the report. A full copy of the database report is provided on the CD at the rear of this report.

Table 5.1 Summary of Envirocheck Data

	0-249m	250-500m	Details
Contaminated Land Register Entries and Notices			Not Applicable (N/A).
Authorised industrial processes (IPC/IPPC/LAPPC).	6	7	The closest entry relates to Xsys Print Solutions Ltd, 5m southwest, for manufacturing of printing inks.
Fuel Stations Entries	0	0	N/A
Licensed radioactive substances	0	0	N/A
Enforcements, prohibitions or prosecutions	1	1	Entries relates to a fly-tipping incident 210m southeast of the site prior to April 2005 and a fly-tipping incident 420m west of the site prior to April 2004.
Discharge Consents	3	2	The closest entry relates to Storm Sewage Overflow operated by United Utilities Water PLC located 175m south of the site.
Pollution Incidents / Substantiated Pollution Incident Register	5	14	An on-site incident relates to a Category 3 – Minor Incident on 30 th July 1998 noted 'Oils in Brook' The closest off-site incident relates to Category 2 (Significant impact to Air), 15m south of the site on 8 th September 2004; the type of pollution is not recorded.
Consents issued under the Planning (Hazardous Substances) Act 1990	1	1	Closest entry relates to Charles Tennant and Co, located 195m southwest of the site; relating to arsenic-containing materials.
Control of Major Accident Hazard (COMAH) sites	1	2	On site entry relates to BASF Printing Systems Ltd

6.0 CONCEPTUAL SITE MODEL (CSM)

6.1 Initial CSM

In accordance with Environment Agency, CLR 11 (2004) and BSI 10175 (Code of Practice for Investigation of Potentially Contaminated Land), REC Ltd have developed an initial CSM to identify potential contamination sources, migration pathways and receptors within the study area.

6.2 Contaminant Sources

On-site Potential Sources

- Based on an incident report of oils in the brook to the east, it is possible diesel or other oils were stored on-site but there is no evidence of any underground storage tanks and this may relate to a simple spill during vehicle repair maintenance and relate to impact via drainage. There is no confirmation that this incident was attributed to the former BASF site;
- Activity reports for the BASF plant indicate solvents (non-specific information) were used on-site but the storage location of such chemicals could not be identified. Large tanks seen on-site held inks;
- The vehicle repair buildings may have contained small quantities of oils and solvents for degreasing. The actual use of these buildings has not been confirmed as entry was not possible. It is REC's understanding these buildings are being retained;
- Made Ground imported to level the site may contain inorganic compounds or resulted in organic matter being buried that could generate ground gas;
- The wash down area may have mobilised minor quantities of oils or road materials. Although there are no stains in the area in question. The receiving point of the discharge from this area is unknown.
- One roofed structure appears to have asbestos cement roofing; and
- A transformer is present on the northern boundary which is open to elements. A small adjacent brick building may also contain a transformer. Given the age of the site, it is possible PCB containing oil has been used in these units.

Off-site Potential Sources

- The area surrounding the site is industrial and commercial. Storage of mobile contaminants such as oils should not be discounted on the up-gradient side, though none were identified; and
- There are a number of waste handling sites to the southwest but these should be immobile wastes and as such unlikely to generate a risk to this site.

6.3 Potential Pathways

- The proposed penetration of existing ground is for stanchions for the new steel frame. The exposure pathway duration for construction workers will as such be limited. The excavated materials should be tested before disposal or re-use on-site;
- Because the site is capped and the proposed new building fully vented to atmosphere, there is no inhalation or ground gas build up issue associated with the development. All other buildings have been in place for a significant period and as such are not considered to be impacted or at risk of such;
- The asbestos cement roofed structure does not pose a risk providing it is either left untouched and remains in good condition. Should it be subject to demolition or refurbishment then it should be undertaken according to best practice;
- Solvents used on-site could have impacted groundwater beneath the site and migrate with shallow groundwater towards the brook. However, there is no record of volumes used, where they were stored or of any incidents of loss to the subsurface; and
- There is no evidence of hydrocarbon impact around the transformer on site but there may be PCB containing oils within the unit;

6.4 Potential Receptors

- The Brook remains the only significant receptor for any loss of potential contaminants on the site;
- The shallow ground does not contain a significant aquifer and neither does the underlying bedrock so controlled waters are not considered a viable receptor;
- The site workers will be based in an existing building for which there are no anticipated impacts;
- Removal and disposal of the asbestos roofing does not require a licensed asbestos contractor. However, suitable precautions and assessment should be made of the activity if site workers are used to remove this material; and,
- The transformer should be drained and the oils chemically tested to determine PCB content prior to disposal. The unit should be handled by suitably trained personnel.

7.0 CONCLUSIONS & RECOMMENDATIONS

Conclusion

The proposed development consists of a protected but open to atmosphere structure built on an existing concrete pad. The structure will be used to store wood while it cures. The wood will not be treated with chemicals on-site and run-off will not occur as the building is roofed. Based on the proposed use the site there is considered to be **low** risk in terms of contaminated land liabilities.

A question remains over the use and possible impact from solvents on the site but there are no records or reports of any incidents and no indication as to where it may have been stored. The oil impact to the brook was in 1998 and there are no other recorded incidents of impact to the brook that are associated with this site.

The asbestos roof material on the northern boundary is not regulated. The transformer on-site may contain PCBs and care should be taken if this unit is either changed or the oil replaced.

Recommendations

In the event that any chemical odours are encountered during any shallow sub-surface works for stanchions, an environmental consultant should be asked to review the materials and coordinate chemical testing to confirm the nature of the impact. A report should then be submitted to the Council indicating the nature of any findings.

Any works on the transformer should include chemical testing of the oils. It may be possible to obtain records of maintenance from past site owners or their contractors.

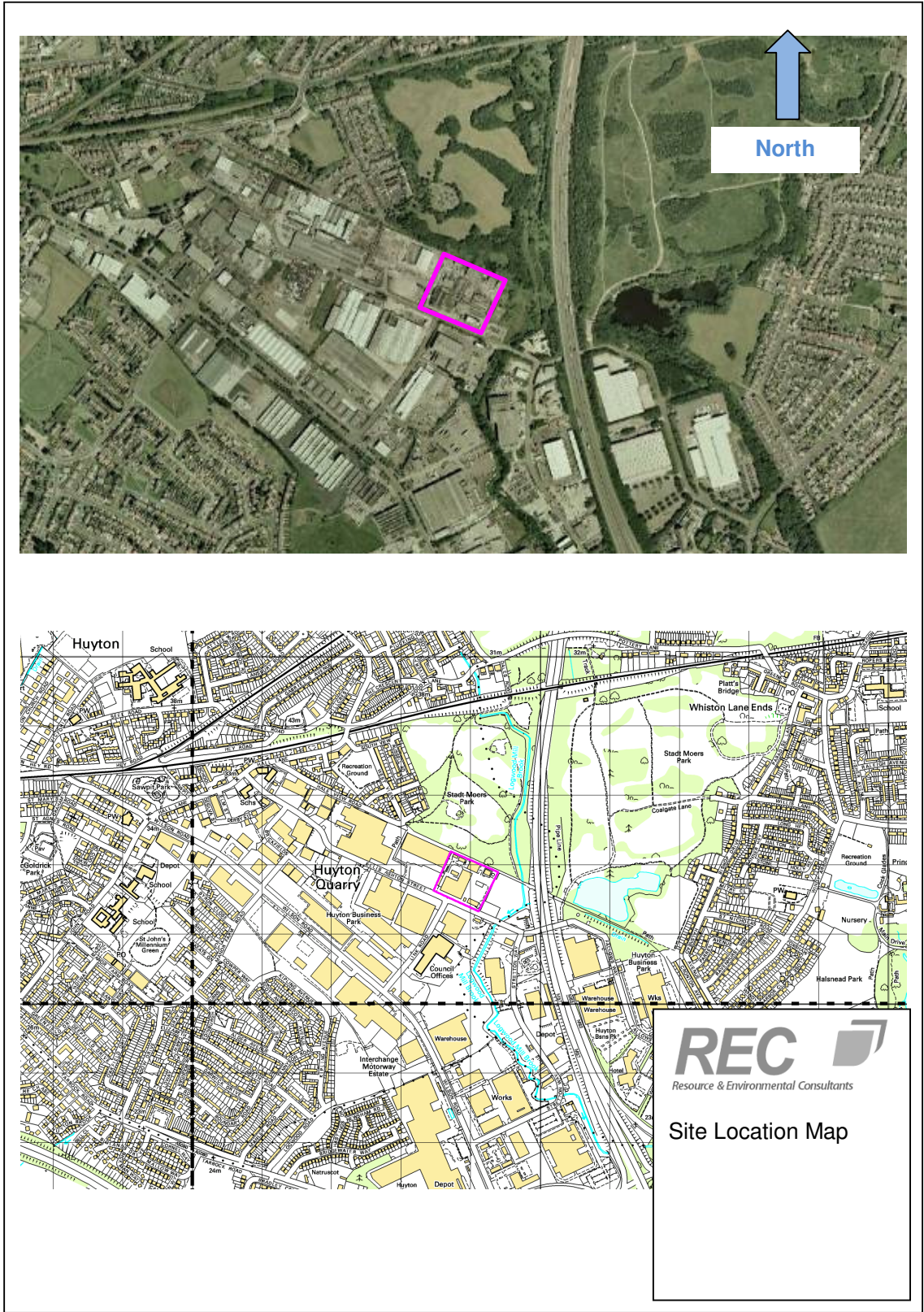
The asbestos containing materials should be handled by personnel appropriately trained or prepared for such a task.

Since the site redevelopment relies upon retaining the existing concrete base within the new structure and no new buildings are planned that would be considered susceptible to gas build-up, it is REC's opinion that an intrusive investigation is not required for this development.

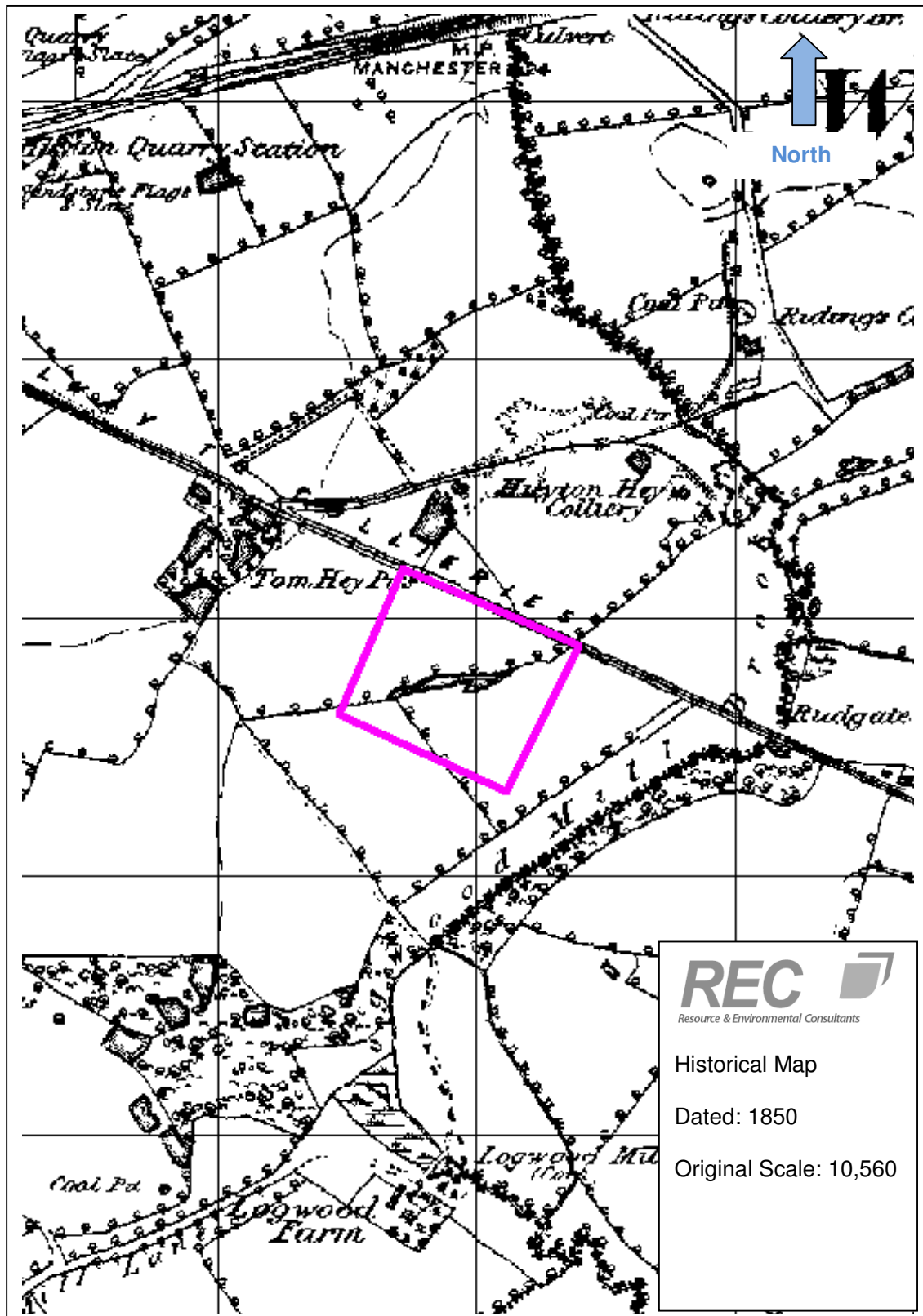
APPENDIX I
LIMITATIONS

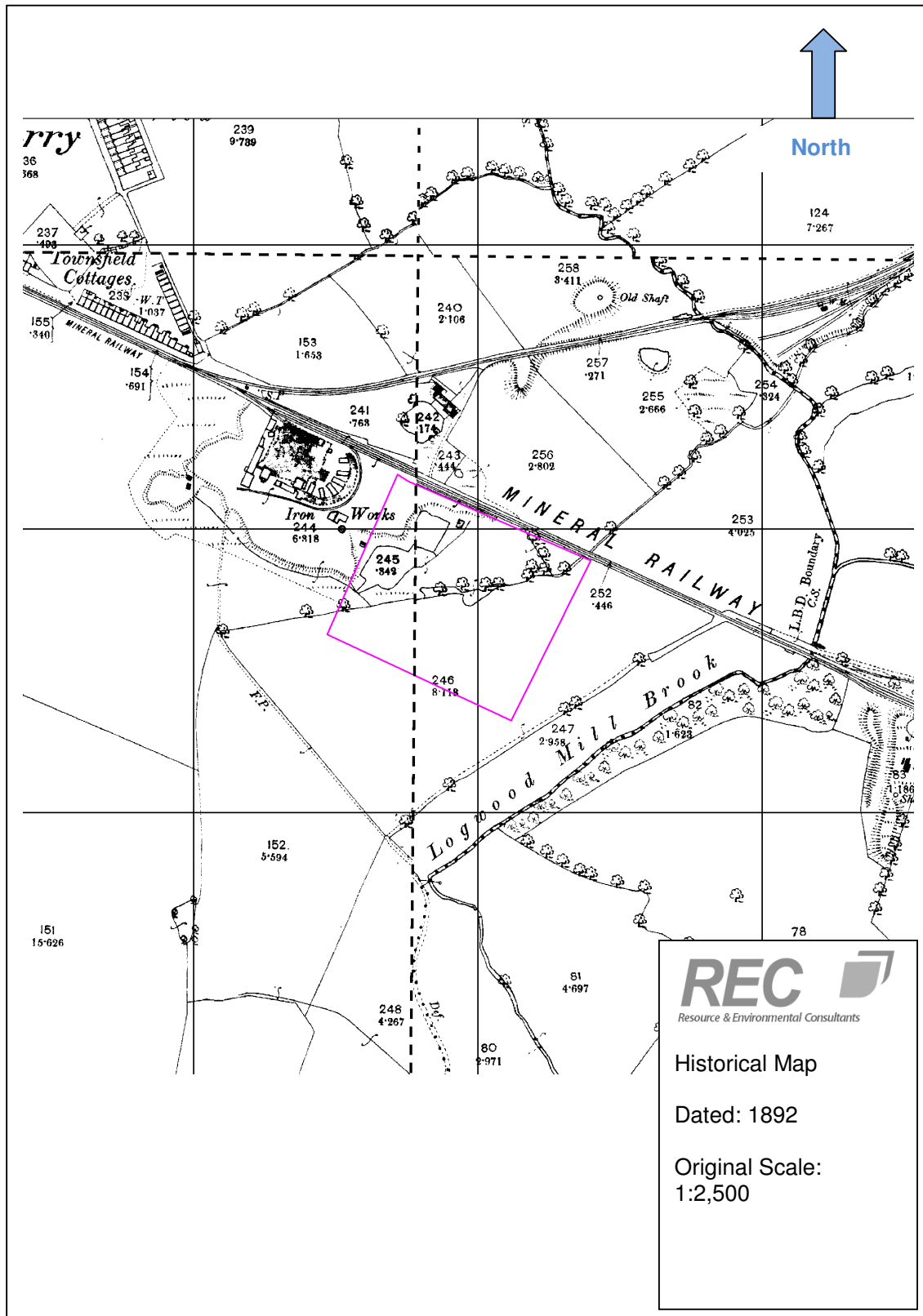
1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between REC Ltd and the Client as indicated in Section 1.2.
2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information it has been assumed it is correct. No attempt has been made to verify the information.
3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.
4. During the site walkover reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.
5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.
6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.
7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials this is for indicative purposes only and do not constitute or replace full and proper surveys.
8. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.
9. REC can not be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by REC is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by REC in this connection without their explicit written agreement there to by REC.
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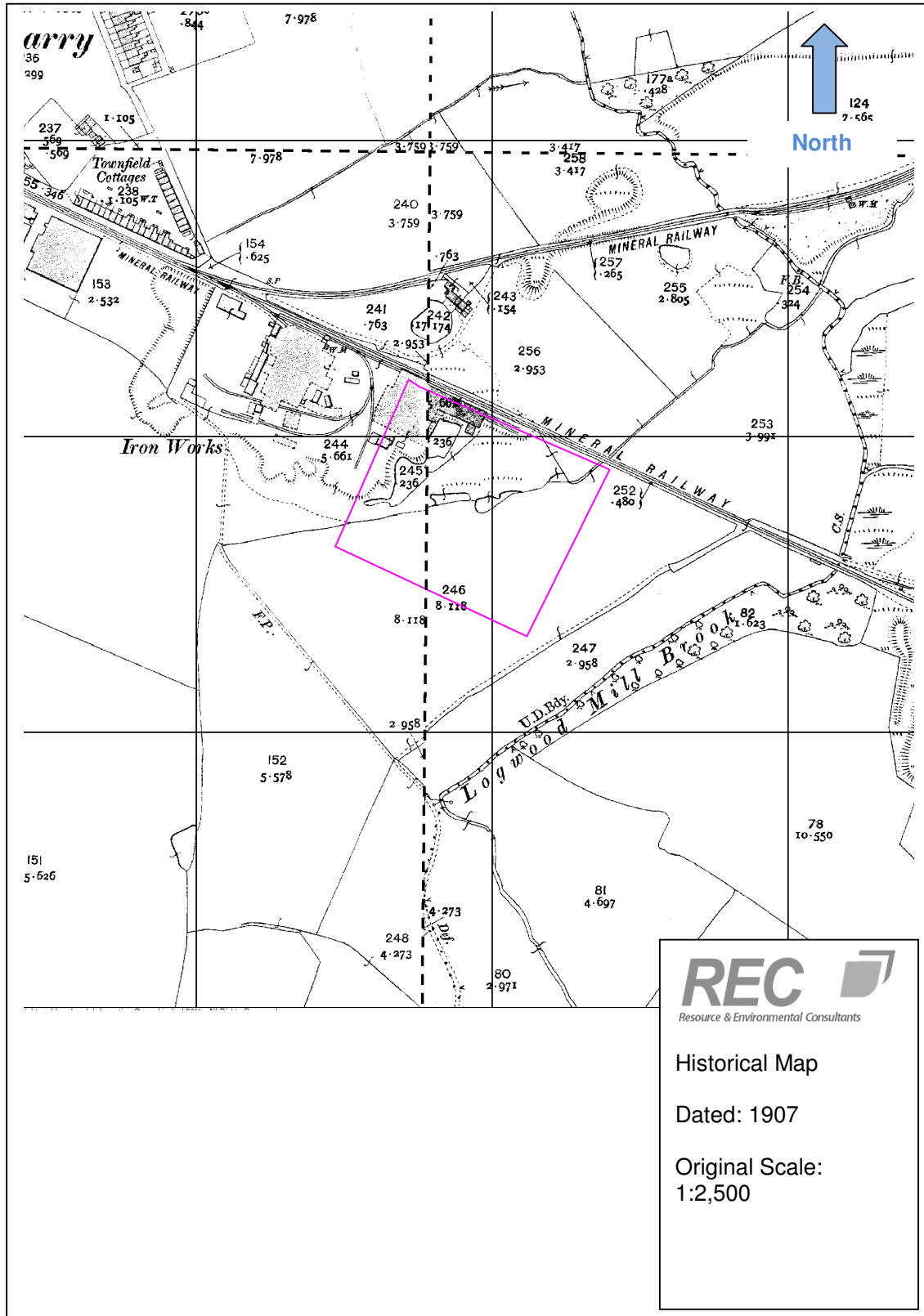
APPENDIX II
SITE LOCATION PLAN



APPENDIX III
HISTORICAL MAPS





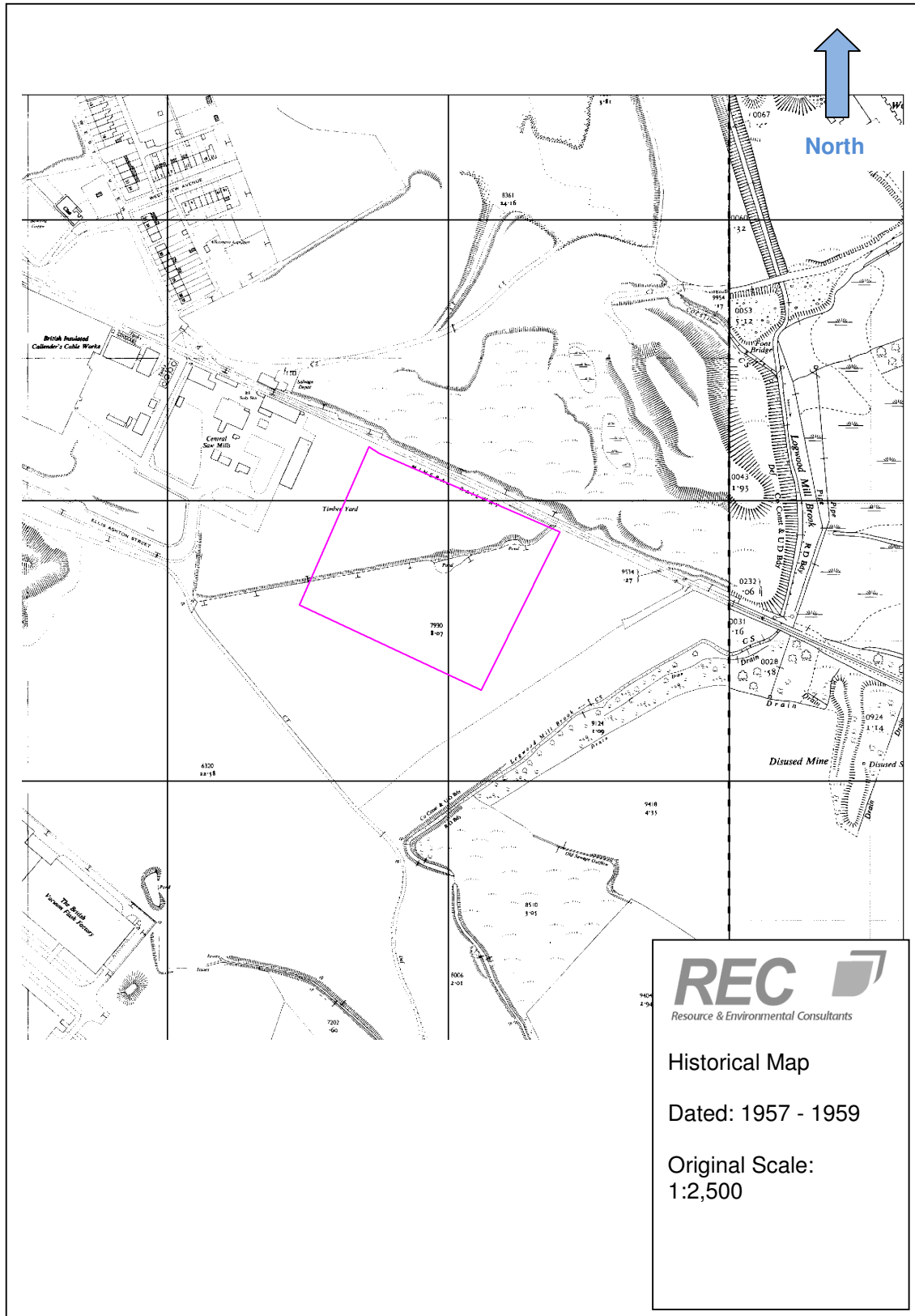


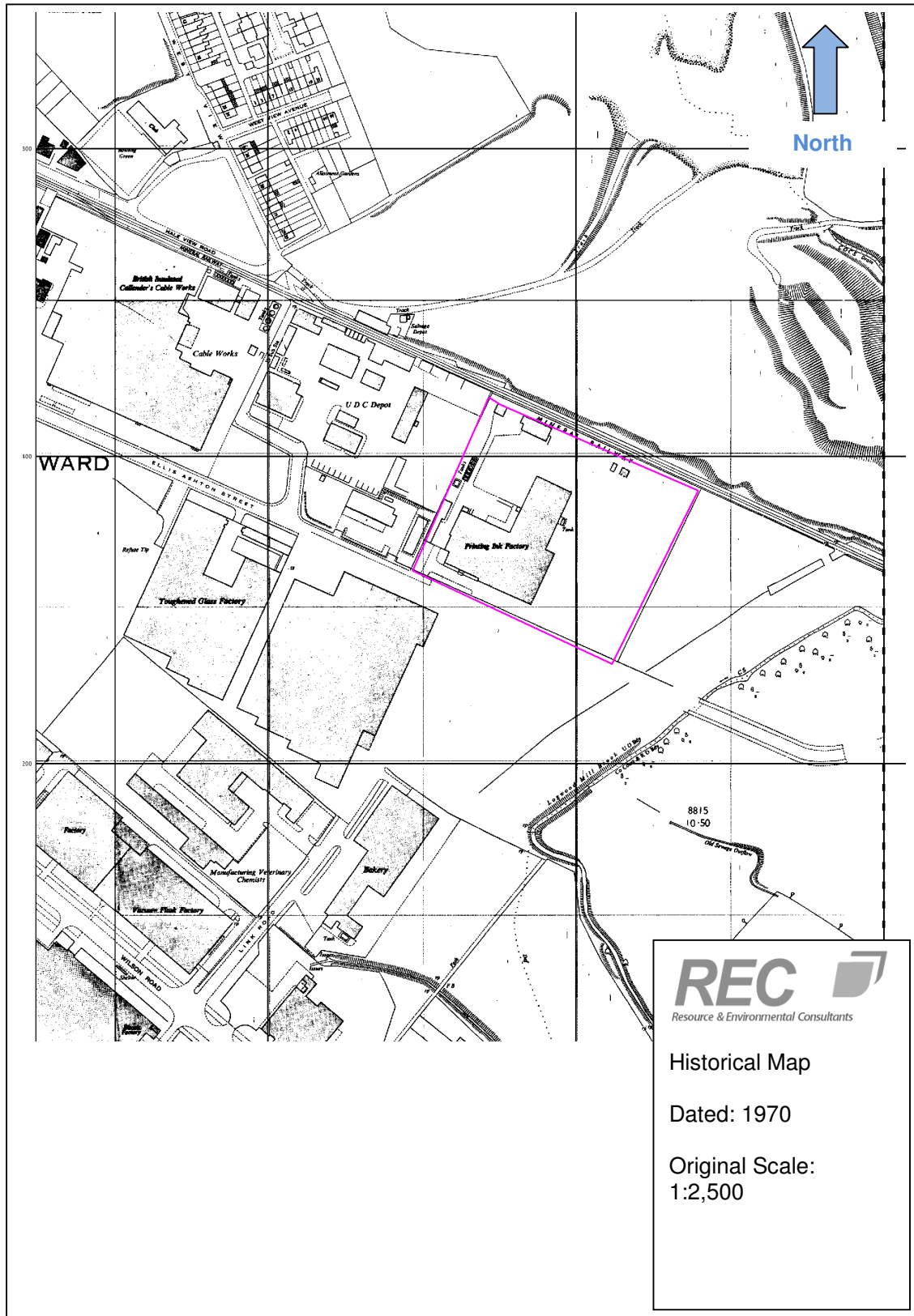


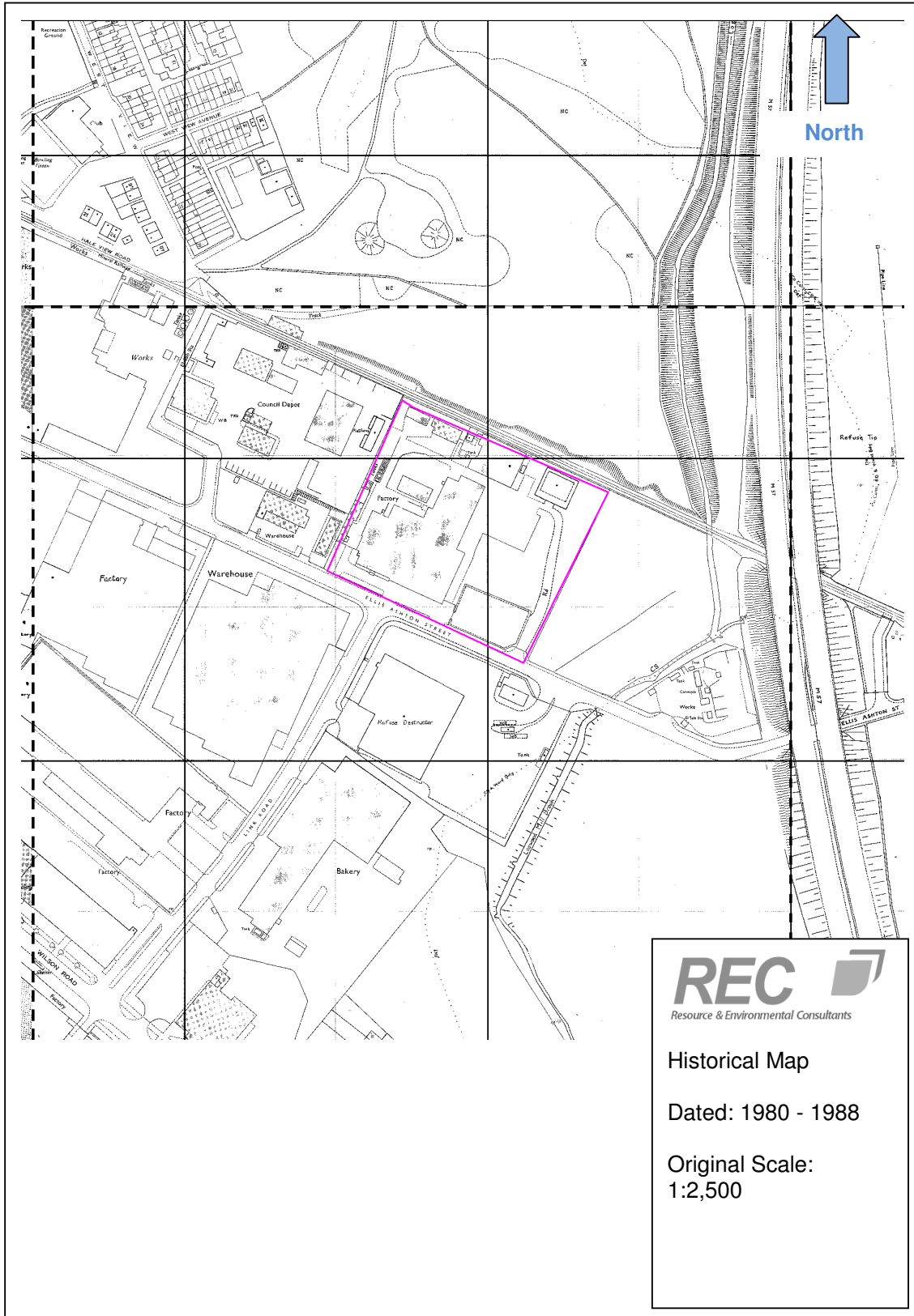
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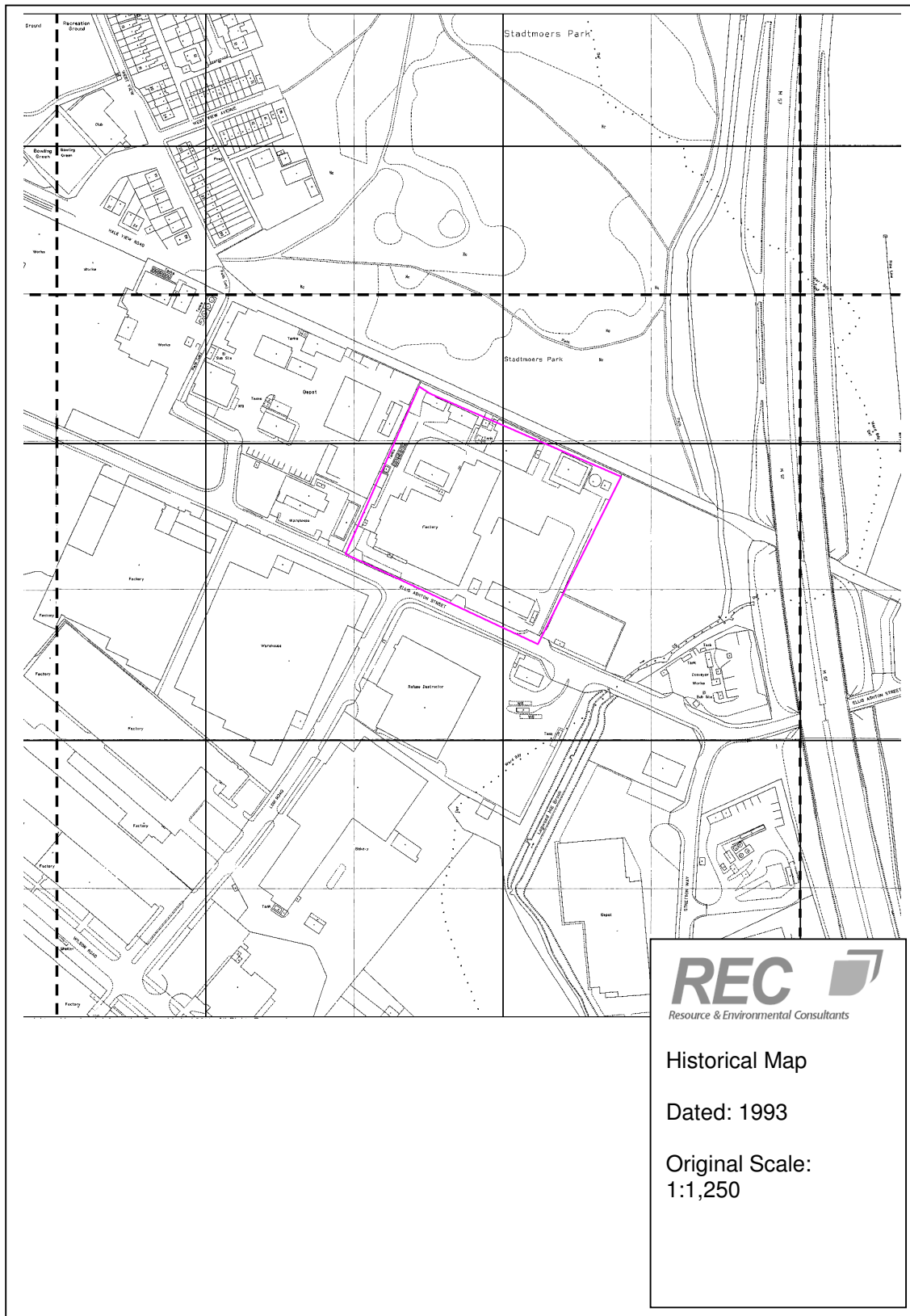


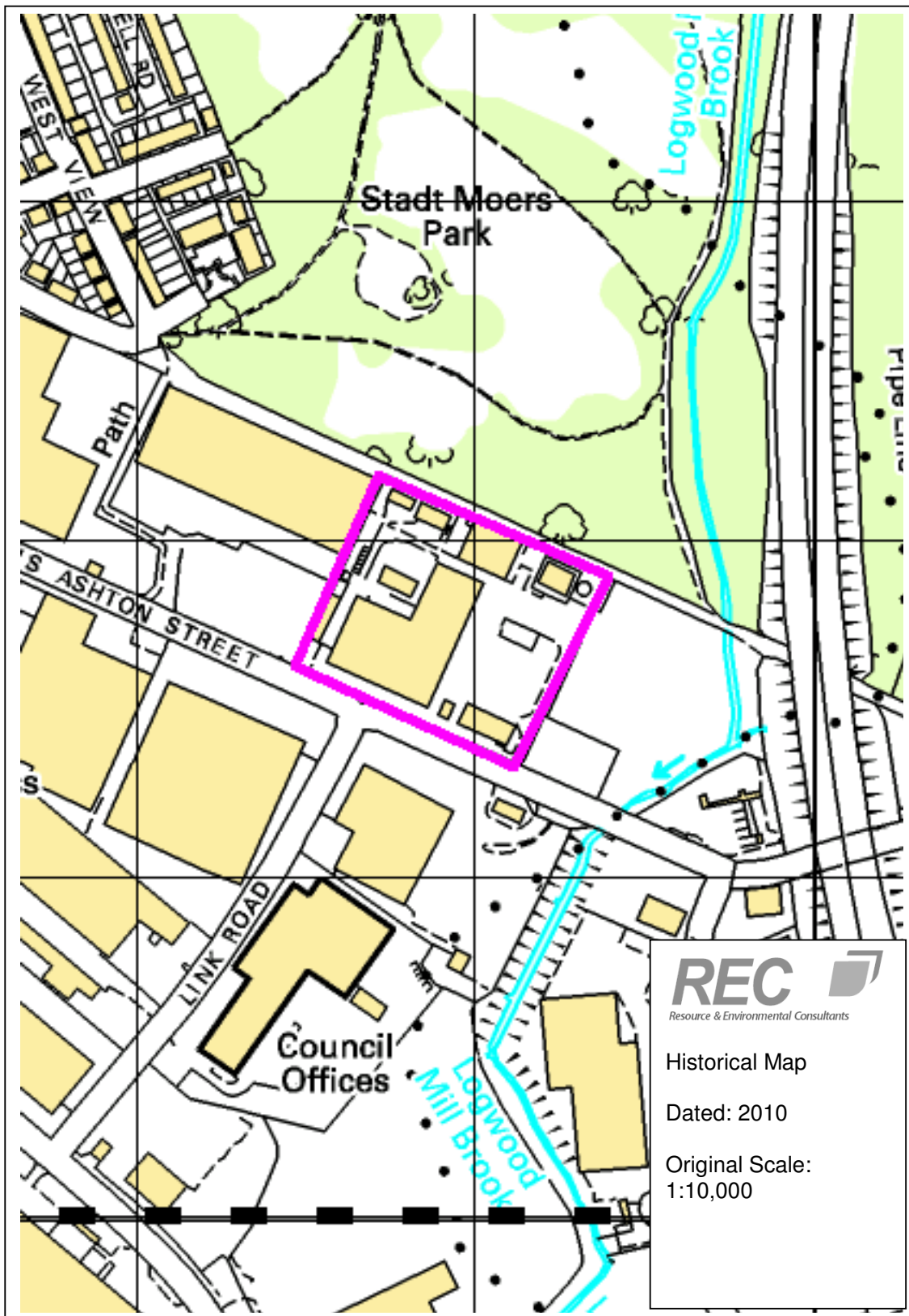
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Appendix IV
Photographs



Northeast corner showing fire tank, asbestos roof
and formerly vertical tanks, waiting for disposal



Washdown shed



Vehicle maintenance (assumed)



Transformer with Sub-station on left



Washdown area with sump in left corner



Demolished main building with floor intact



Offices fronting onto Allis Ashton Street

APPENDIX V

**CD CONTAINING A COMPLETE
PDF DOCUMENT OF THIS REPORT
& ALL SUPPORTING DATA**

**PHASE II
GEO-ENVIRONMENTAL SITE INVESTIGATION**

**Eastern Section
Ellis Ashton Street
Huyton
Merseyside**

**REC Report: 43938p3r0
Issued: December 2012**

Prepared for:

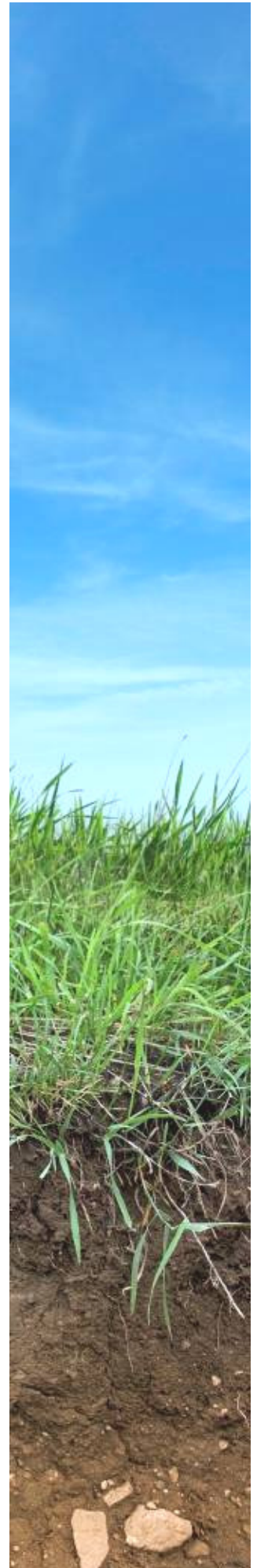
Hardwood Sales Ltd

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QUALITY ASSURANCE

Issue/revision	Issue 1	Revision 1	Revision 2	Revision 3
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EXECUTIVE SUMMARY

Exploratory Investigation

An intrusive site investigation comprising six window sample probeholes to a maximum depth of 4.00m bgl was completed on the 22nd October 2012. In addition, REC identified existing 19mm diameter environmental monitoring wells which were also gauged for depth to water, sampled where appropriate and included in surveying for relative elevation.

Ground Conditions

Made Ground was encountered within each exploratory hole location to a maximum proven depth of 3.00m bgl and generally comprised of concrete underlain by granular strata (predominantly sandy gravel).

Natural superficial drift deposits generally comprised of firm to stiff gravelly clay to a maximum proven depth of 4.00m bgl.

Solid geological formation of weathered grey MUDSTONE was encountered at two exploratory hole locations at between 3.20m and 3.30m bgl.

Tier 1 Risk Assessment

For the purposes of the Tier 1 assessment REC have compared the laboratory test data directly to the relevant Tier 1 GAC value for the protection of human health and controlled waters. The results of this direct comparison indicate that:

- The Made Ground contains no significant contaminant concentrations but an elevated pH value associated with Galigoo was identified at one location. This will not be an issue unless either utilities are laid through this area or the material is excavated and requires off-site disposal; and
- There were no exceedances of contaminant concentrations of determinants compared with the relevant thresholds in groundwater; therefore there is no significant risk to controlled waters.

Asbestos was not identified in any of the soil samples submitted for screening analysis.

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	Drawing No 43938p3/002 – Exploratory Hole Location Plan
	Drawing No 43938p3/003 – Groundwater Contour Plan
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Appendix V	Chemical Testing Results
Appendix VI	Origin of Generic Assessment Criteria

A CD containing all relevant environmental database information, historical & geological mapping and a complete PDF version of this report is attached to hard copy of the report.

1.0 INTRODUCTION

1.1 Background

Resource and Environmental Consultants (REC) Ltd have been commissioned by Ian Fogarty Associates on behalf of Hardwood Sales Ltd (HSL) to undertake the second stage of a Phase II geo-environmental investigation at the location of a now demolished factory off Ellis Ashton Street, Huyton.

The first phase of work consisted of a desk study report (Geo-Environmental Site Assessment, REC Ref: 43938p1r0, March 2011). The second phase was carried out on the western side only, following agreement with Knowsley MBC, to permit construction to begin on a steel framed building that was to be placed on the existing concrete pad (Geo-Environmental Site Investigation, REC Ref: 43939p2r0, November 2011).

This third stage of investigation has been carried out on the eastern side of the site to complete the site characterization required to satisfy the planning process. The scope of work consisted of an intrusive ground investigation, comprising six probeholes being completed as environmental monitoring installations along with associated sampling and analysis of soils and waters combined with sampling from previously installed wells.

1.2 Development

HSL have constructed an atmosphere storage unit which is used to dry timber on the former factory location on the western section of the site. There are currently no proposed plans to develop the eastern section of the site. In the event demolition does take place, due care will be required for asbestos sheeting on roofs of existing buildings.

1.3 Objectives

The objectives of the environmental investigation are to:

- Undertake a preliminary stage of investigation and analysis to provide an overview of conditions identified on the eastern side;
- Assess the implications of any potential environmental risks, liabilities and development constraints associated with the site in relation to the future use of the site and in relation to off-site receptors;
- Compare the results of the investigation on the eastern side with the those of the western side; and,
- Provide recommendations regarding future works required.

1.4 Limitations

The limitations of this report are presented in Appendix I. All acronyms used within this report are defined in the Glossary presented in Appendix II.

1.5 Confidentiality

REC has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed.

Should any third party wish to use or rely upon the contents of the report, written approval must be sought from REC; a charge may be levied against such approval.

2.0 SUMMARY OF EXISTING REPORTS

2.1 Geo-Environmental Site Assessment

The following is a copy of the executive summary from the initial site assessment report.

EXECUTIVE SUMMARY

The site was formerly associated with printing and inks, and was operated by BASF. The site is currently unoccupied and in the process of having the larger building demolished. The footprint of the old building and its existing concrete floor will then be used to construct a timber curing building that will be roofed and have vented side cladding. The venting means the building is not capable of retaining and confining gas or vapour.

Site personnel will work out of existing offices located next to the site entrance on the southern boundary. The proposed use represents a fire risk but there are plans to have significant damping capability to mitigate any possible impacts, using the existing fire suppression system installed by BASF.

Historical Development

Historical Ordnance Survey maps from 1850 show that the site was undeveloped, after which the site was partly occupied by an iron works until after 1927, a timber yard until after 1966 and a printing ink factory after 1968 to present day.

Several factories and industrial activities situated within 250m of the site are shown on maps from 1950s onwards, including an electric lamp works, saw mill, cable works, council depot and refuse destructor. A number of shafts and collieries are shown on maps from 1850 within 250m of the site, although these are shown as being disused by the 1900s. Landfilling activities are indicated to the north and west of the site in the 1950s to the 1970s.

Environmental Setting

The site is considered to be situated in a low to moderately sensitive environmental setting as Longwood Mill Brook is located 55m to the east. The surrounding properties are all industrial and the underlying strata are classified as a Secondary A aquifer, though these may be afforded protection by the presence of low permeability Glacial Till.

Conceptual Site Model

Minor sources such as a transformer and asbestos containing roofing will not generate a risk to human health provided due care is exercised during any handling. The location of any solvent stores has not been confirmed but there are no new planned enclosed buildings within which any human exposure could be a concern. The same applies for ground gas since the new building will be vented and not sealed.

There are no significant aquifers beneath the site and no new reports of impact to the Brook. The long term risk to controlled waters from the site is therefore considered negligible.

Conclusion

*Based on the proposed end use and environmental setting, the site is considered to represent a **low/moderate** risk in terms of contaminated land liabilities.*

Recommendations

Site investigation works are not considered necessary at this time. Should site use change or new occupied structures be planned then a site investigation is likely to be required.

2.2 Geo-Environmental Site Investigation (Western Side)

The following is a copy of the executive summary from the initial intrusive site investigation on the western side.

EXECUTIVE SUMMARY

Exploratory Investigation

An intrusive site investigation comprising the advancement of six window sample probeholes to a maximum depth of 4.70m bgl was completed on the 10th November 2011. In addition, REC identified existing 19mm diameter environmental monitoring wells which were also gauged for depth to water and surveyed for relative elevation.

Ground Conditions

Made Ground was encountered within each exploratory hole location to a maximum proven depth of 1.80m bgl and generally comprised of non reinforced concrete underlain by granular strata (predominantly sandy gravel)

Natural superficial drift deposits generally comprised of firm to stiff medium to high strength gravelly clay to a maximum proven depth of 4.50m bgl underlain by very stiff very high strength grey MARL was encountered to a maximum proven depth of 4.60m bgl.

Solid geological formation of weathered grey MUDSTONE was encountered within each exploratory hole location between 3.30m and 4.70m bgl.

Tier 1 Risk Assessment

For the purposes of the Tier 1 assessment REC have compared the laboratory test data directly to the relevant Tier 1 GAC value for the protection of human health and controlled waters. The results of this direct comparison indicate that:

- The Made Ground contains metals and organics at concentrations that would be unacceptable in landscaped areas but not beneath hard standing for commercial developments; and*
- The only mobile organic contaminant in groundwater is TCE which is present at low concentrations which is indicative of a small low concentration source which should not pose a significant risk to controlled waters.*

Asbestos was identified at one location in the Made Ground. Any excavation works in this area will require a detailed method statement and risk assessment prior to works commencing.

Ground Gas Assessment

During the monitoring visit completed to date, no significantly elevated concentrations of methane or carbon dioxide were recorded within any of the probeholes.

Inline with the guidelines outlined in CIRIA C665 REC would classify the ground gas regime as Characteristic Situation 1 (CS1), which would indicate that negligible ground gas conditions exist and that no special protective measures are required.

This is an interim assessment based on preliminary ground gas readings, the final classification will be supplied as an addendum to this report on completion of the remaining monitoring visits.

2.3 Summary of Existing Reports

The desk study identified solvents use on site but the solvents were stored in above ground storage tanks. Based on the proposed end use and environmental setting, the site was considered to represent a **low/moderate** risk in terms of contaminated land liabilities.

The only issues identified within the first stage of intrusive investigation on the western side of the site are the presence of low concentrations of TCE in groundwater and asbestos identified in the shallow Made Ground. The investigation of the eastern side of the site took these issues into account.

3.0 SITE INVESTIGATION

3.1 Potential Contaminant Sources

Potential contamination sources have been identified from the desk study and these are listed in Table 3.1 below:

Table 3.1 Summary of Potential Contaminant Sources

Potential Source	Potential Contaminants	Potential Impact
Above Ground Fuel Tank	Hydrocarbons	Groundwater and human health
Infilled pond and drainage ditch/stream	Migration pathway and ground gas	Human health
Made Ground across the site	Metals and hydrocarbons	Groundwater and human health

3.2 Intrusive Investigation (Eastern Side)

The revised CSM as set out in 43938p2r0 identified exceedances of Tier 1 values for metals in the shallow Made Ground but no associated risk as the site was to remain capped. The RCM also identified a potential risk to groundwater from TCE and some dissolved metals. The metals were discounted as a risk based on the low concentration present and the distance to any receptor. This phase of investigation is designed to further investigate the impact of TCE and any fuel/lubricant/transformer associated hydrocarbons. In addition, exploratory holes have also been advanced to provide information on baseline conditions across all the eastern side of the site and downgradient boundaries.

Exploratory fieldwork was completed on the 22nd October 2012. The works are summarised in Table 3.2. the field work does not include ground gas testing as the site is to remain capped and un-developed. Should any new buildings be planned, then gas monitoring on existing wells should be completed.

Table 3.2 Summary of Fieldwork

Potential Source/Rationale	Location Hole	Type	Maximum Depth (m bgl)	Monitoring Wells Response Zone
Baseline / Ground Gas	WS201	Window Sample Probehole	2.930	0.00 – 1.00
Baseline / Ground Gas	WS202	Window Sample Probehole	3.910	0.00 – 1.00
Baseline / Ground Gas	WS203	Window Sample Probehole	3.910	0.00 – 1.00
Baseline / Ground Gas	WS204	Window Sample Probehole	3.135	0.00 – 1.00
Baseline / Ground Gas	WS205	Window Sample Probehole	3.920	0.00 – 1.00
Baseline / Ground Gas	WS206	Window Sample Probehole	3.190	NA

Notes

m bgl – metres below ground level.

The window sample probeholes were designed to supplement the findings of the Initial Conceptual Site Model (ICSM) with their locations based on the previously determined groundwater flow direction.

The sampling locations are illustrated in Drawing No 43938p3/002 (Appendix III). The ground conditions encountered and details of monitoring well response zones are indicated on the logs which are provided in Appendix V.

A return visit was made to monitor installations for groundwater level and selected wells were purged and samples of groundwater recovered for chemical analysis. In addition to sampling water from the six new window sample wells, water samples were also collected from MW304 and MW309.

Soil and groundwater samples destined for chemical analysis were collected in appropriate sampling containers. All samples were subsequently stored in cooled boxes prior to submission to analytical laboratory.

All samples were collected using appropriate PPE and sampling equipment that was cleaned at each sampling location. A detailed copy of REC Ltd sampling methodology, QA procedures and laboratory chain of custody forms can be provided upon request.

3.3 Laboratory Analysis

Selected soil samples were submitted for a range of chemical analysis comprising, metals, pH, total sulphate, water soluble sulphate (2:1 extract), sulphide, cyanide, phenols, total and speciated poly-aromatic hydrocarbons (PAHs), asbestos, organic carbon and total and speciated petroleum hydrocarbon (TPH).

Scientific Analysis Laboratories (SAL) Ltd of Manchester undertook the analytical work and the testing results are included in Appendix V and discussed in Section 5.0.

Laboratory analysis sheets are included in Appendix VI and are summarised in Section 5.0:

4.0 GROUND AND GROUNDWATER CONDITIONS

4.1 Ground Conditions

4.1.1 Summary of Ground Conditions

The ground investigation generally confirms the published geology and identifies the strata set out in Table 4.1 below:

Table 4.1 Summary of Strata

Strata	Typical Description	Min Depth to Top of Strata (m)	Max Depth to Top of Strata (m)	Max Thickness (m)
Made Ground: Non reinforced Concrete	Grey non re-enforced concrete.	0.00	0.00	0.50
Made Ground: Gravelly sand	Grey gravelly fine to medium sand. Gravel is sub-angular to angular fine to medium of brick and concrete.	1.00	1.50	0.50
Made Ground: Sandy gravel	Brown grey sandy clayey gravel. Gravel is sub-angular to angular of brick, concrete, ash and mixed lithology.	0.50	3.00	1.20
Sandy CLAY	Predominantly a Soft brown/grey sandy CLAY. Sand is fine to medium. In locations WS202 and WS203 a soft black sandy organic CLAY with plant rootlets throughout between 1.70 and 2.00m bgl.	1.00	3.00	1.50
Gravelly CLAY	Firm to stiff brown slightly gravelly CLAY. Gravel is sub angular to sub rounded fine to medium of mixed lithology.	2.00	4.00	1.60
MUDSTONE	Grey weathared MUDSTONE.	3.00	3.30	0.30

4.1.2 Made Ground

Made Ground was encountered within each exploratory hole location and generally comprised of non reinforced concrete underlain by granular strata (predominantly sandy gravel) to a maximum proven depth of 3.00m bgl.

4.1.3 Drift Deposits

Natural superficial drift deposits generally comprised of firm to stiff gravelly clay to a maximum proven depth of 4.00m bgl.

Referring to organic matter identified in WS202 and WS203 appears to coincide with the presence of a pond and drainage stream identified in the Historical maps from 1850 to 1957 in the desk study (Geo-Environmental Site Assessment, REC Ref: 43938p1r0, March 2011).

4.1.4 Solid Geology

Pennine Middle Coal Measures

A total of twelve exploratory probeholes have been installed on the site, six in the phase II site investigation of the western side of the site (November 2011) in which solid geological formations of weathered grey MUDSTONE was encountered within each exploratory hole location at between 3.30m and 4.70m bgl.

The phase III investigation installed a further six exploratory probehole locations on the eastern side of the site, with solid geological formations of weathered grey MUDSTONE encountered at WS201 and WS206 at between 3.20 and 3.30m bgl.

4.2 Groundwater Conditions

The depth to groundwater for the new wells are summarised in Table 4.2 below:

Table 4.2 Summary Groundwater Data

Location	DtW (m below groundlevel)	Relative GL elevation (m)	WTE (relative - m)	Notes
WS201	0.735	6.826	6.091	Depth to standing water measured during first sampling visit.
WS202	1.582	8.085	6.503	
WS203	1.831	8.458	6.627	
WS204	1.836	8.537	6.701	
WS205	1.077	8.474	7.397	
WS206	1.178	7.55	6.372	
WS304	1.072	7.227	6.155	
WS308	1.373	7.457	6.084	
WS309	1.642	6.9	5.258	

Monitoring was undertaken using an interface probe to record the depth to groundwater and the thickness of any free phase hydrocarbon product, if present. The well gauging data was then used in conjunction with relative elevation data to determine relative water table elevations (WTE) across the eastern side of the site. The data was used to construct a groundwater contour plan included as Drawing 43938P3/003 in Appendix III. Referring to this drawing, groundwater flow direction is predominantly to the south-southeast. A raised former parking area in the central eastern portion of the site is assumed to have localised influence on flow.

5.0 TIER 1 QUALITATIVE CONTAMINATED LAND RISK ASSESSMENT

REC has undertaken a Tier 1 qualitative risk assessment to determine if any potential contaminants within the underlying soils and groundwater pose an unacceptable level of risk to the identified receptors.

5.1 Human Health Risk Assessment

At a Tier 1 stage the long term (chronic) human health toxicity of the soil has been assessed by comparing the on-site concentrations of organic and inorganic compounds with reference values published by the EA (Contaminated Land Exposure Assessment (CLEA) Soil Guideline Values (SGV)) and where absent, Generic Assessment Criteria (GACs) published by LQM/CIEH (2nd edition).

The results of this comparison have been summarised within Table 5.1 (overleaf).

Table 5.1 Summary of Inorganic and Hydrocarbon Toxicity Assessment for a Commercial End Use – mg/kg

Determinand	Units	GAC ^{v3}	n	MC	Loc. of Ex	Pathway	Assessment
Arsenic	mg/kg	640	6	14	WS202	1	No exceedance
Cadmium	mg/kg	230	6	<1	NA	1	No exceedance
Chromium (VI)	mg/kg	35	6	27	WS206	1	No exceedance
Lead ⁽ⁱⁱ⁾	mg/kg	590	6	180	WS203	1	No exceedance
Mercury	mg/kg	410	6	<1	NA	2	No exceedance
Nickel	mg/kg	1800	6	31	WS206	1	No exceedance
Selenium	mg/kg	13000	6	<3	NA	1	No exceedance
Copper ⁽ⁱⁱ⁾	mg/kg	71700	6	110	WS201	1	No exceedance
Zinc ⁽ⁱⁱ⁾	mg/kg	665000	6	430	WS205	1	No exceedance
Cyanide - Total	mg/kg	16200	6	<1	NA	1	No exceedance
Phenols - Total.	mg/kg	1100000	6	<1	NA	1	No exceedance
pH	-	5-8	6	12.3	WS204 1.0-1.8m,		Further assessment for foundation
Naphthalene	mg/kg	200	9	0.02	WS203	2	No exceedance
Acenaphthylene	mg/kg	84000	9	<0.01	NA	3	No exceedance
Acenaphthene	mg/kg	85000	9	0.08	WS203	1	No exceedance
Fluorene	mg/kg	64000	9	0.04	WS203	1	No exceedance
Phenanthrene	mg/kg	22000	9	0.73	WS203	3	No exceedance
Anthracene	mg/kg	530000	9	0.21	WS203	3	No exceedance
Fluoranthene	mg/kg	23000	9	2.1	WS203	3	No exceedance
Pyrene	mg/kg	54000	9	2.0	WS203	3	No exceedance
Benzo(a)Anthracene	mg/kg	90	9	0.75	WS203	3	No exceedance
Chrysene	mg/kg	140	9	0.74	WS203	3	No exceedance
Benzo(b/k)Fluoranthene ⁽ⁱ⁾	mg/kg	100	9	0.96	WS203	3	No exceedance
Benzo(a)Pyrene	mg/kg	14	9	0.59	WS203	3	No exceedance
Indeno(123-cd)Pyrene	mg/kg	60	9	0.47	WS203	3	No exceedance
Dibenzo(a,h)Anthracene	mg/kg	13	9	0.11	WS203	3	No exceedance
Benzo(ghi)Perylene	mg/kg	650	9	0.53	WS203	3	No exceedance
TPH C ₅ -C ₆ (aliphatic)*	mg/kg	3400	6	<0.10	NA	2	No exceedance
TPH C ₆ -C ₈ (aliphatic)*	mg/kg	8300	6	<0.1	NA	2	No exceedance
TPH C ₈ -C ₁₀ (aliphatic)*	mg/kg	2100	6	0.14	WS202	2	No exceedance
TPH C ₁₀ -C ₁₂ (aliphatic)*	mg/kg	10000	6	1	WS203	2	No exceedance
TPH C ₁₂ -C ₁₆ (aromatic)*	mg/kg	36000	6	28	WS203	1	No exceedance
TPH C ₁₆ -C ₂₁ (aromatic)*	mg/kg	28000	6	39	WS203	1	No exceedance
TPH C ₂₁ -C ₃₅ (aromatic)*	mg/kg	28000	6	87	WS203	1	No exceedance

Notes

Main Exposure Pathways: 1 = Soil Ingestion, 2 = Vapour Inhalation (indoor), 3 = Dermal Contact & Ingestion, 4 = Dust Inhalation.

Abbreviations: GAC = General Assessment Criteria, n = number of samples, ME = Maximum Exceedance concentration; Loc of Ex = Location of Exceedances

* The Tier 1 GAC for the hydrocarbon fraction is derived from the CIEH assessment for petroleum hydrocarbons Criteria Working Group (CWG) for both aliphatic and aromatic compounds. REC has utilised the Tier 1 values for aliphatic compounds for the volatile and semi volatile fractions (C₅-C₁₂) and the Tier 1 values for aromatic compound for the non volatile fractions (C₁₂-C₃₅). The comparison of a total (aliphatic/aromatic) compounds to an individual fraction is a conservative approach and satisfactory for the protection of human health.

(i) Benzo (b) Fluoranthene (100mg/kg) Benzo (k) Fluoranthene (140mg/kg)

Referring to Table 5.1, there are no exceedances of screening values for particular compounds, metals or carbon ranges compared to the relevant Tier 1 thresholds. However, the white material (Galigoo) identified in WS204 had a pH value of 12.3. While this could generate a potential hazard if exposed it is currently under hard standing. Laboratory analyses determined that pH in the underlying natural ground is significantly lower. The likely down groundwater gradient wells of WS203, WS206 and WS202 also did not show any significantly elevated pH in the soils. It is unlikely therefore that there is any pH related metals mobilisation away from this location.

Asbestos was not identified in any of the soil samples submitted for screening analysis.

5.2 Controlled Waters

The groundwater vulnerability map shows the site to be located over a minor aquifer (Alluvial Deposits) with a moderate risk of leaching. The lack of impact within the clays on both sides of the site suggests the risk to the aquifer is negligible. However, there is also a downgradient stream that could act as a receptor. Therefore a Tier I risk assessment has been undertaken with concentrations of determinants compared with the EQS thresholds. These are presented in Table 5.2.

Table 5.2 – Comparison of Groundwater Sample Results with Tier I Controlled Water EQS Values (µg/l)

Determinand	Units	EQS ⁽¹⁾	Drinking Water Threshold	n	MC	No of Ex	Loc of Ex	Assessment
Organics								
PAH *	µg/l	0.1	0.1	7	3	2	WS202, WS204	Summarised
Napthalene	µg/l	10	-	7	1.8	NA	NA	No Exceedance
Benzo(a)pyrene ⁽³⁾	µg/l	0.05	0.01	7	<0.001	NA	NA	No Exceedance
benzo[b/k]fluoranthene	µg/l	0.03	-	7	<0.001	NA	NA	No Exceedance
benzo[g,h,i]perylene & indeno[1,2,3-cd]pyrene	µg/l	0.02	-	7	<0.001	NA	NA	No Exceedance
Benzene	µg/l	30	1	6	<1	NA	NA	No Exceedance
Toluene	µg/l	50		6	<1	NA	NA	No Exceedance
Ethyl Benzene ¹	µg/l	20	-	6	<1	NA	NA	No Exceedance
Xylenes	µg/l	30	-	6	<1	NA	NA	No Exceedance
MTBE	µg/l	-	-	6				
Total Petroleum Hydrocarbons ^{##}	µg/l	-	10	6	N.D	NA	NA	No Exceedance
TPH Aliphatic C5-C6	µg/l	10	10	6	<10	NA	NA	DWS
TPH Aliphatic C6-C8	µg/l	10	10	6	<10	NA	NA	Cyclohexane
TPH Aliphatic C8-C10	µg/l	17	10	6	<10	NA	NA	Octane
TPH Aliphatic C10-C12	µg/l	10	10	6	<10	NA	NA	DWS
TPH Aliphatic C12-C16	µg/l	10	10	6	<10	NA	NA	DWS
TPH Aliphatic C16-C35	µg/l	10	10	6	<10	NA	NA	DWS
TPH Aromatic C6-C7	µg/l	170	10	6	<10	NA	NA	WFD
TPH Aromatic C7-C8	µg/l	42	10	6	<10	NA	NA	Toluene
TPH Aromatic C8-C10	µg/l	17	10	6	<10	NA	NA	Xylene
TPH Aromatic C10-C12	µg/l	21	10	6	<10	NA	NA	Naphthalene
TPH Aromatic C12-C16	µg/l	0.015	10	6	<10	NA	NA	1,3,5-Trimethyl Benzene
TPH Aromatic C16-C21	µg/l	0.002	10	6	<10	NA	NA	Crysene Sol
TPH Aromatic C21-C35	µg/l		10	6	<10	NA	NA	

Notes:

Solubility <0.01µg/

- EQS values obtained from EA Chemicals Data web-site and reflect the Water Framework Directive guidance; except
- For certain TPH carbon ranges, the odour threshold in water has been taken from Odorous Emissions Report, 1985, which identifies compounds within the carbon ranges and the concentration at which they can be detected. This is chosen to meet the WFD limits for Surface Water which are odour, taste and impact to aquatic life based.
- Specified compounds are benzo[b]fluoranthene (CAS 205-99-2), benzo[k]fluoranthene (CAS 207-08-9), benzo[g,h,i]perylene (CAS 191-24-2) and indeno[1,2,3-c,d]pyrene (CAS 193-39-5). The parametric value applies to the sum of the concentrations of the individual compounds detected and quantified in the monitoring process.

For the purposes of the Tier 1 assessment the result of this direct comparison indicates that no compounds exceed any of the screening criteria for particular compounds or carbon ranges. However, the total PAH guideline value of 0.1µg/l is exceeded at two locations. However this screening value applies to the four PAH compounds identified in the Water Framework Directive (WFD) which states that the sum of these four substances should not be exceeded: none of the four PAHs were detected.

6.0 CONCLUSIONS & RECOMMENDATIONS

Environmental Assessment

An intrusive investigation consisting of six probeholes completed as monitoring wells and the collection of soil and groundwater samples was carried out between the 22nd October and 1st November 2012. The soils and water samples were analysed for organic and inorganic contaminants. Visual and olfactory evidence along with analytical reports indicates there were no significant contaminant issues beneath the site for continued commercial use.

Recommendations

The Tier I Human Health Risk has not identified any concentrations of constituents of concern that exceed the Tier I screening values for the protection of human health. The elevated pH at one location will only become an issue if it is excavated as it has no chemical or physical suitability and will become waste.

Consequently there are no issues relating to the subsurface on this side of the site as it currently stands. REC does not recommend any further intrusive works. However, any of the buildings remaining on the eastern side that are scheduled for demolition should have the necessary surveys for asbestos and appropriate plans in place to handle such materials.

END OF REPORT

APPENDIX I
LIMITATIONS

APPENDIX I LIMITATIONS

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between REC Ltd and the Client as indicated in Section 1.2.
 2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information it has been assumed it is correct. No attempt has been made to verify the information.
 3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.
 4. During the site walkover reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.
 5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.
 6. In addition to the above REC Ltd note that when investigating, or developing, potentially contaminated land it is important to recognise that sub-surface conditions may vary spatially and also with time. The absence of certain ground, ground gas, and contamination or groundwater conditions at the positions tested is not a guarantee that such conditions do not exist anywhere across the site. Due to the presence of existing buildings and structures access could not be obtained to all areas. Additional contamination may be identified following the removal of the buildings or hard standing.
 7. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.
 8. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials this is for indicative purposes only and do not constitute or replace full and proper surveys.
 9. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.
 10. This report presents an interpretation of the geotechnical information established by excavation, observation and testing. Whilst every effort is made in interpretative reporting to assess the soil conditions over the Site it should be noted that natural strata vary from point to point and that man made deposits are subject to an even greater diversity. Groundwater conditions are dependent on seasonal and other factors. Consequently there may be conditions present not revealed by this investigation.
 11. REC can not be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by REC is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by REC in this connection without their explicit written agreement there to by REC.
 12. Rather, this investigation has been undertaken to provide a preliminary characterisation of the existing sub-surface geotechnical characteristics and make up and the findings of this study are our best interpretation of the data collected, within the scope of work and agreed budget. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.
 13. This investigation has been undertaken to reasonably characterise existing sub-surface conditions and the findings of this study are our best interpretation of the data collected, within the scope of work and agreed budget. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.
-

APPENDIX II
GLOSSARY

TERMS

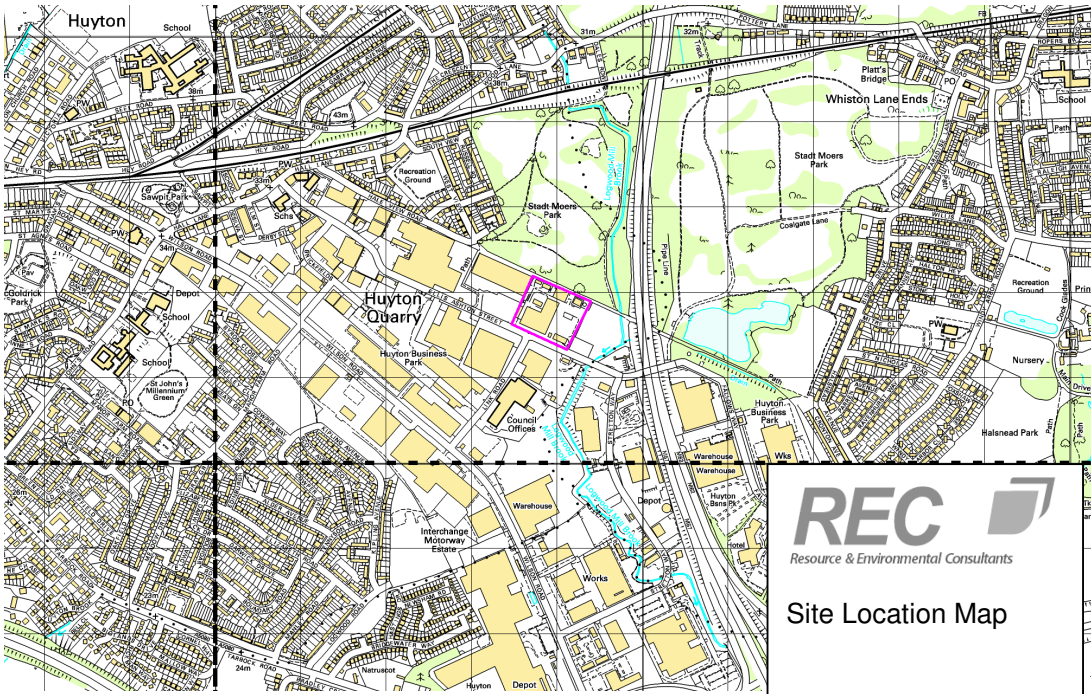
AST	Above Ground Storage Tank
BGS	British Geological Survey
BSI	British Standards Institute
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CIEH	Chartered Institute of Environmental Health
CIRIA	Construction Industry Research Association
CLEA	Contaminated Land Exposure Assessment
CSM	Conceptual Site Model
DNAPL	Dense Non-Aqueous Phase Liquid (chlorinated solvents, PCB)
DWS	Drinking Water Standard
EA	Environment Agency
EQS	Environmental Quality Standard
GAC	General Assessment Criteria
GL	Ground Level
GSV	Gas Screening Value
HCV	Health Criteria Value
ICSM	Initial Conceptual Site Model
LNAPL	Light Non-Aqueous Phase Liquid (petrol, diesel, kerosene)
ND	Not Detected
LMRL	Lower Method Reporting Limit
NR	Not Recorded
PAH	Poly Aromatic Hydrocarbon
PCB	Poly-Chlorinated Biphenyl
PID	Photo Ionisation Detector
QA	Quality Assurance
SGV	Soil Guideline Value
SPH	Separate Phase Hydrocarbon
Sp.TPH (CWG)	Total Petroleum Hydrocarbon (Criteria Working Group)
SPT	Standard Penetration Test
SVOC	Semi Volatile Organic Compound
UST	Underground Storage Tank
VCCs	Vibro Concrete Columns
VOC	Volatile Organic Compound
WTE	Water Table Elevation

UNITS

m	Metres
km	Kilometres
%	Percent
%v/v	Percent volume in air
mb	Milli Bars (atmospheric pressure)
l/hr	Litres per hour
µg/l	Micrograms per Litre (parts per billion)
ppb	Parts Per Billion
mg/kg	Milligrams per kilogram (parts per million)
ppm	Parts Per Million
mg/m ³	Milligram per metre cubed

m bgl	Metres Below Ground Level
m bcl	Metre Below Cover Level
mAOD	Metres Above Ordnance Datum (sea level)
kN/m ²	Kilo Newtons per metre squared
µm	Micro metre

APPENDIX III
FIGURES



REC
Resource & Environmental Consultants
Site Location Map

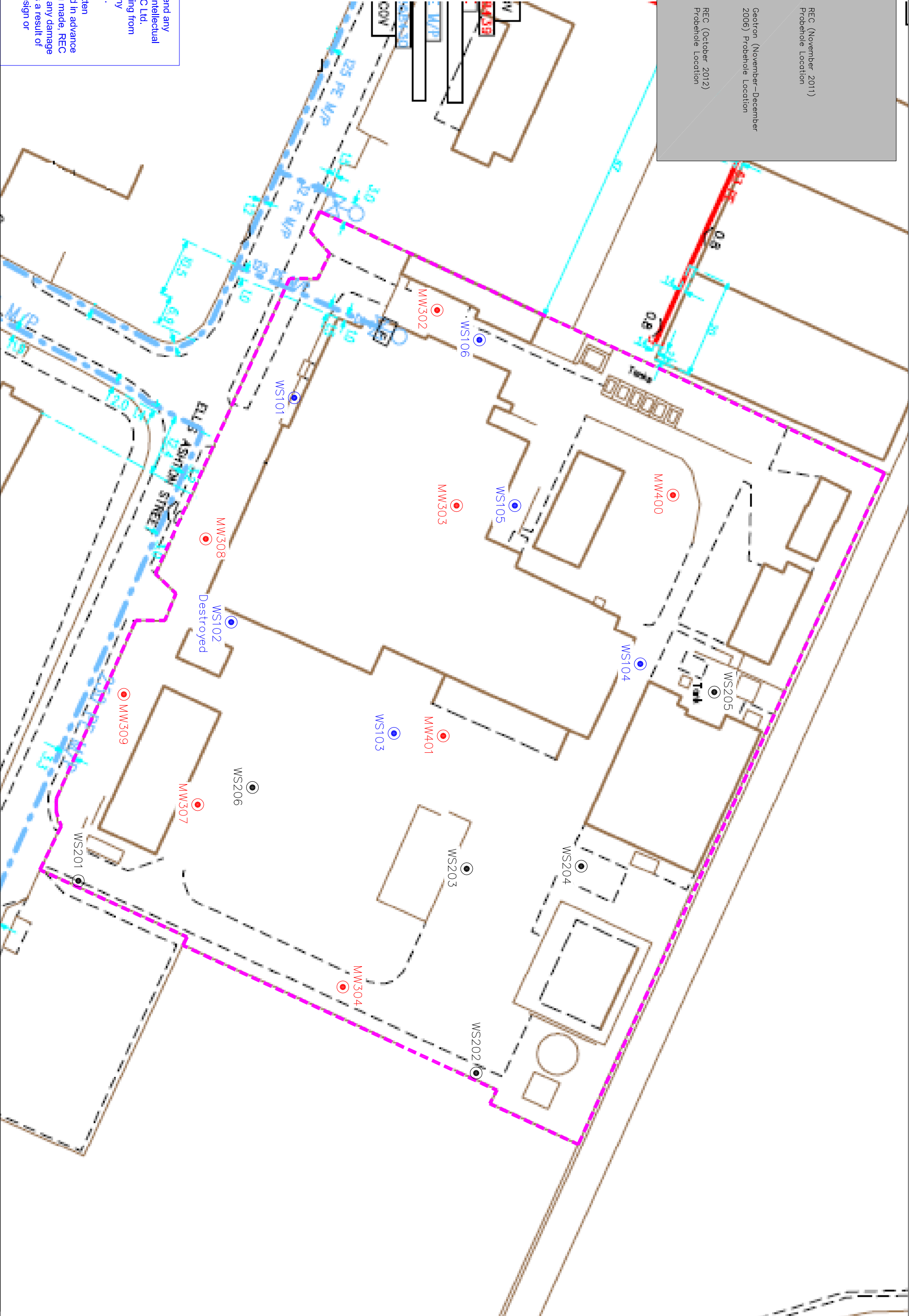
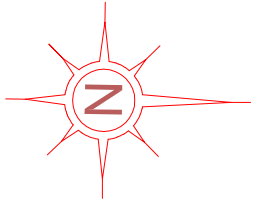
Key

- WS101

REC (November 2011)
Probehole Location
- MW301

Geotron (November–December 2006) Probehole Location
- WS201

REC (October 2012)
Probehole Location



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Website: www.rectd.co.uk

Job Title:

Ellis Ashton Street

Client:

Hardwood
Sales Ltd.

Job No: 43938

Drawn by: R. Willoughby

Approved by: M. Wright

Scale: NTS

06-11-12

Notes:

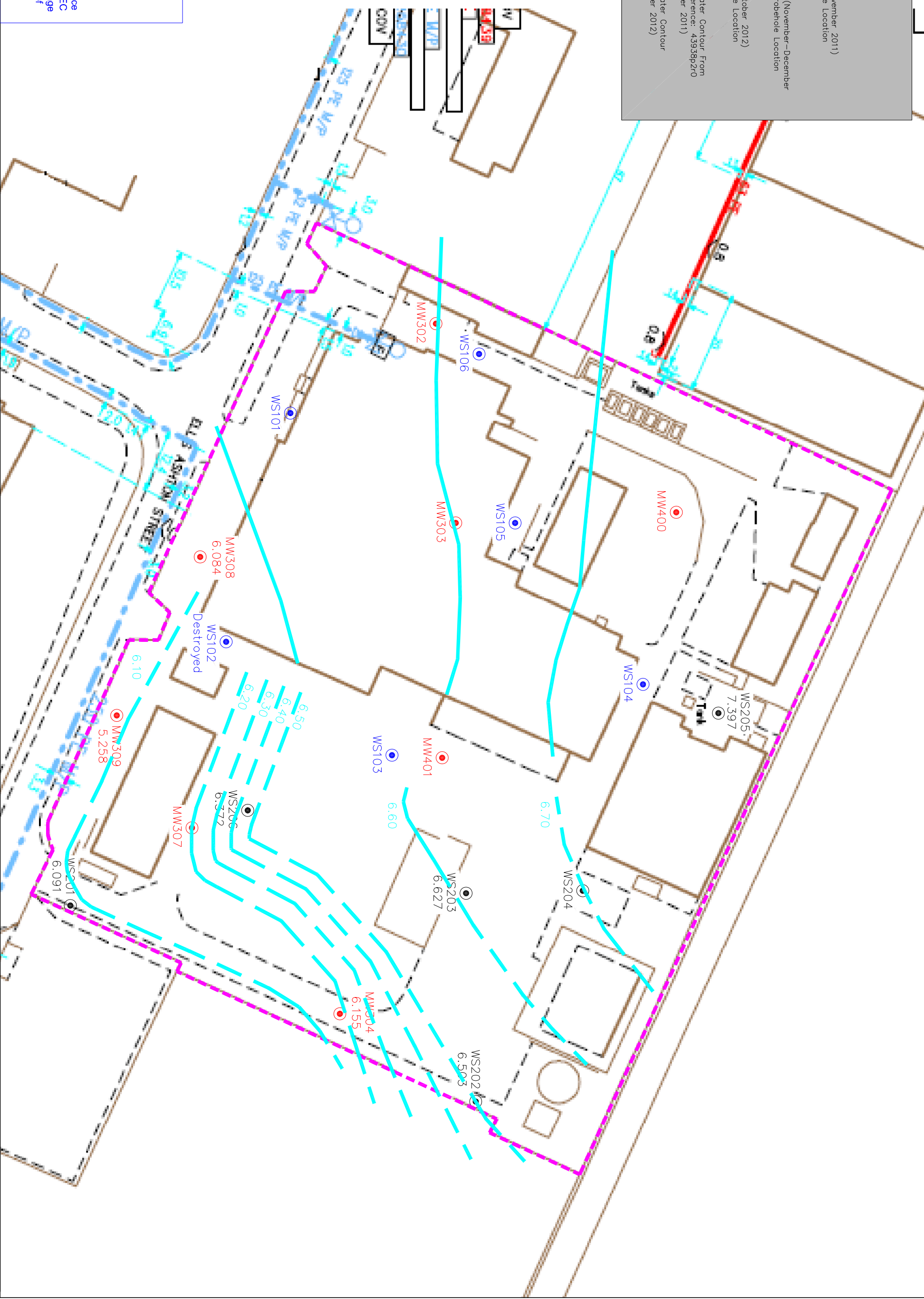
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Drawing Title:

43938p2r0/002
Groundwater
Contour Plan

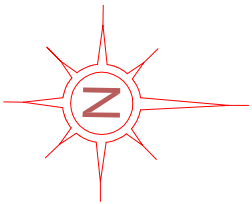
Key

-
- REC (November 2011)
Probahole Location
- WS101
- REC (November–December 2006) Probahole Location
- Groundwater Contour From REC Reference: 43535p210 (November 2011)
- Groundwater Contour (November 2012)
- WS201



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Job Title:

Client:

Ellis Ashton Street

Hardwood
Sales Ltd.

Job No: 43938

Drawn by: R. Willoughby

Approved by: M. Wright

Scale: NTS

DATE: 06-11-12

Notes:

N.B: An arbitrary site datum of 10.00m was taken for Window Sample 101

Drawing Title:

43938p2r0/002
Groundwater
Contour Plan

APPENDIX IV
REC EXPLORATORY LOGS

Borehole Record - Window Sample

Probehole Number: WS101

Project Number: 43938

Contract Name: Ellis Ashton Street

Client: Ian Fogarty Associates

Engineer: Simon Howard

Date Started: 10/11/2011

Date Completed: 10/11/2011

Elevation AOD (m): N/A

Co-ordinates: N/A

Drilling Equipment: Mini tracked window sampler rig



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SUBSURFACE PROFILE

SAMPLES AND IN-SITU TESTING

Depth (mbgl)	Legend	Description	Depth of Strata (mbgl)	Type	Depth (mbgl)	In-Situ Testing SPT / U100	Water Level (mbgl)	Monitoring Installation / Backfill
		MADE GROUND: Brown slightly clayey gravelly fine to medium sand. Gravel is sub-angular to angular fine to coarse of brick and concrete.	0.47	ES	0.30			
		MADE GROUND: Brown very clayey slightly gravelly fine to medium sand. Gravel is sub-angular to angular of mudstone with slight solvent odour.	0.65	ES	0.50			
1.0		Firm to stiff medium high strength brown slightly gravelly CLAY. Gravel is sub-angular to angular of mudstone.	1.80	ES	1.20			
2.0		Stiff to very stiff high to very high strength brown/grey gravelly CLAY. Gravel is sub-angular to angular fine to medium of coal and mudstone.	2.80					
3.0		Very stiff very high strength grey MARL	3.50					
		Grey very weathered mudstone.	3.70	ES	3.40			
4.0		Probehole terminated at 3.70m bgl due to refusal						
5.0								
6.0								

Key

B. Bulk (Bag)

W. Water

U100. 100mm Undisturbed

U38. 38mm Undisturbed Sample

SPT. Standard Penetration Test

D. Disturbed

G. Amber Glass Jar / Bottle

CPT. Cone Penetration Test

U100. Blows (Recovery mm)

V. 40ml Glass Vial

T. Plastic Tub

N. 'N' Value

HV. Hand Shear Vane

PID. Photo Ionisation Detector

ES. Environmental Sample

Notes

Groundwater: See page at 0.50m bgl and damp at 3.50m bgl

Services: Prior to drilling the location was scanned with a cable avoidance tool (CAT).

Addition of water: None added

Casing diameter: 110mm

Date logged: 15/11/11

Status: Final

Borehole Record - Window Sample

Probehole Number: WS102

Project Number: 43938

Contract Name: Ellis Ashton Street

Client: Ian Fogarty Associates

Engineer: Simon Howard

Date Started: 10/11/2011

Date Completed: 10/11/2011

Elevation AOD (m): N/A

Co-ordinates: N/A

Drilling Equipment: Mini tracked window sampler rig



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SUBSURFACE PROFILE

SAMPLES AND IN-SITU TESTING

Depth (mbgl)	Legend	Description	Depth of Strata (mbgl)	Type	Depth (mbgl)	In-Situ Testing SPT / U100	Water Level (mbgl)	Monitoring Installation / Backfill
		MADE GROUND: Red brown very gravelly slightly clayey fine to medium sand with occasional pink ink staining. Gravel is sub-angular fine to coarse of brick and concrete.	0.45	ES	0.20			
			0.60	ES	0.60			
1.0		MADE GROUND: Brown very clayey slightly gravelly fine to medium sand. Gravel is sub-angular to angular fine to medium of mixed lithology.						
		MADE GROUND: Brown gravelly coarse sand. Gravel is sub-angular to sub-rounded fine to medium of mixed lithology.						
2.0		Firm to stiff medium to high strength brown slightly gravelly CLAY. Gravel is sub-angular to sub-rounded fine to medium of mixed lithology.	1.90	ES	1.90			
		Stiff to very stiff high to very high strength grey gravelly CLAY. Gravel is sub-angular to sub-rounded fine to medium of coal and mudstone.	2.60					
3.0		Very stiff to very high strength grey MARL						
		Grey weathered mudstone.	3.40	ES	3.20			
4.0		Probehole terminated at 3.70m bgl due to refusal						
5.0								
6.0								

Key

B. Bulk (Bag)

W. Water

U100. 100mm Undisturbed

U38. 38mm Undisturbed Sample

SPT. Standard Penetration Test

D. Disturbed

G. Amber Glass Jar / Bottle

CPT. Cone Penetration Test

U100. Blows (Recovery mm)

V. 40ml Glass Vial

T. Plastic Tub

N. 'N' Value

HV. Hand Shear Vane

PID. Photo Ionisation Detector

ES. Environmental Sample

Notes

Groundwater: Seepage encountered at 0.55m bgl and damp at 3.00m bgl

Services: Prior to drilling the location was scanned with a cable avoidance tool (CAT).

Addition of water: None added

Casing diameter: 110mm

Date logged: 15/11/11

Status: Final

Borehole Record - Window Sample

Probehole Number: WS103

Project Number: 43938

Contract Name: Ellis Ashton Street

Client: Ian Fogarty Associates

Engineer: Simon Howard

Date Started: 10/11/2011

Date Completed: 10/11/2011

Elevation AOD (m): N/A

Co-ordinates: N/A

Drilling Equipment: Mini tracked window sampler rig



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SUBSURFACE PROFILE

SAMPLES AND IN-SITU TESTING

Depth (mbgl)	Legend	Description	Depth of Strata (mbgl)	Type	Depth (mbgl)	In-Situ Testing SPT / U100	Water Level (mbgl)	Monitoring Installation / Backfill
		MADE GROUND: Re-inforced concrete.	0.12					
		MADE GROUND: Grey gravelly fine to medium sand. Gravel is sub-angular to angular fine to medium of brick and concrete.	0.32					
1.0		MADE GROUND: Grey clayey slightly sandy gravel. Gravel is sub-angular to sub-rounded medium to coarse of brick, concrete and sandstone with some ink staining.	1.20	ES	0.80			
		Firm to stiff medium to high strength black/grey sandy organic gravelly CLAY. Gravel is sub-angular to sub-rounded fine to coarse of mixed lithology.	1.60	ES	1.40			
2.0		Soft low strength grey silty organic clay with some rootlets.	2.40	ES	2.30			
		Stiff to very stiff high to very high strength brown grey gravelly CLAY. Gravel is sub-angular to sub-rounded fine to medium of coal and mudstone.	3.00	ES	2.80			
3.0		Very stiff very high strength grey MARL.	3.30					
		Grey weathered mudstone.	3.70					
4.0		Probehole terminated at 3.70m bgl due to refusal						
5.0								
6.0								

Key

B. Bulk (Bag)

W. Water

U100. 100mm Undisturbed

U38. 38mm Undisturbed Sample

SPT. Standard Penetration Test

D. Disturbed

G. Amber Glass Jar / Bottle

CPT. Cone Penetration Test

U100. Blows (Recovery mm)

V. 40ml Glass Vial

T. Plastic Tub

N. 'N' Value

HV. Hand Shear Vane

PID. Photo Ionisation Detector

ES. Environmental Sample

Notes

Groundwater: Damp at 1.00m bgl

Services: Prior to drilling the location was scanned with a cable avoidance tool (CAT).

Addition of water: None added

Casing diameter: 110mm

Date logged: 15/11/11

Status: Final

Borehole Record - Window Sample

Probehole Number: WS104

Project Number: 43938

Contract Name: Ellis Ashton Street

Client: Ian Fogarty Associates

Engineer: Simon Howard

Date Started: 10/11/2011

Date Completed: 10/11/2011

Elevation AOD (m): N/A

Co-ordinates: N/A

Drilling Equipment: Mini tracked window sampler rig



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SUBSURFACE PROFILE

SAMPLES AND IN-SITU TESTING

Depth (mbgl)	Legend	Description	Depth of Strata (mbgl)	Type	Depth (mbgl)	In-Situ Testing SPT / U100	Water Level (mbgl)	Monitoring Installation / Backfill
		MADE GROUND: Re-inforced concrete	0.16					
		MADE GROUND: Brown/red slightly clayey sandy gravel. Gravel is sub-angular to angular fine to coarse of brick and concrete with a faint solvent odour.		ES	0.50			
1.0		Stiff high strength grey/brown very sandy CLAY.	1.10	ES	1.10			
		Firm to stiff medium to high strength grey gravelly CLAY. Gravel is sub-angular to sub-rounded fine to medium of coal and mixed lithology.	1.56					
2.0								
3.0								
4.0								
		Very stiff very high strength grey MARL.	4.50	ES	4.50			
		Grey weathered MUDSTONE.	4.70					
5.0		Probehole terminated at 4.70m bgl due to refusal						
6.0								

Key

B. Bulk (Bag)

W. Water

U100. 100mm Undisturbed

U38. 38mm Undisturbed Sample

SPT. Standard Penetration Test

D. Disturbed

G. Amber Glass Jar / Bottle

CPT. Cone Penetration Test

U100. Blows (Recovery mm)

V. 40ml Glass Vial

T. Plastic Tub

N. 'N' Value

HV. Hand Shear Vane

PID. Photo Ionisation Detector

ES. Environmental Sample

Notes

Groundwater: Groundwater encountered at 1.00m bgl

Services: Prior to drilling the location was scanned with a cable avoidance tool (CAT).

Addition of water: None added

Casing diameter: 110mm

Date logged: 15/11/11

Status: Final

Borehole Record - Window Sample

Probehole Number: WS105

Project Number: 43938

Contract Name: Ellis Ashton Street

Client: Ian Fogarty Associates

Engineer: Simon Howard

Date Started: 10/11/2011

Date Completed: 10/11/2011

Elevation AOD (m): N/A

Co-ordinates: N/A

Drilling Equipment: Mini tracked window sampler rig



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SUBSURFACE PROFILE

SAMPLES AND IN-SITU TESTING

Depth (mbgl)	Legend	Description	Depth of Strata (mbgl)	Type	Depth (mbgl)	In-Situ Testing SPT / U100	Water Level (mbgl)	Monitoring Installation / Backfill
1.0		MADE GROUND: Red/brown sandy gravel. Gravel is sub-angular to angular medium to coarse of brick and concrete.						
2.0		MADE GROUND: Grey brown gravelly clay with some cobbles. Gravel is sub-angular to sub-rounded fine to coarse of coal and mixed litology.	1.80	ES	1.80			
3.0				ES	2.40			
3.30		Very stiff very high strength light grey MARL.	3.30					
3.50			3.50					
4.0		Grey weathered MUDSTONE.						
4.0		Probehole terminated at 3.55m bgl due to refusal						
5.0								
6.0								

Key

B. Bulk (Bag)

W. Water

U100. 100mm Undisturbed

U38. 38mm Undisturbed Sample

SPT. Standard Penetration Test

D. Disturbed

G. Amber Glass Jar / Bottle

CPT. Cone Penetration Test

U100. Blows (Recovery mm)

V. 40ml Glass Vial

T. Plastic Tub

N. 'N' Value

HV. Hand Shear Vane

PID. Photo Ionisation Detector

ES. Environmental Sample

Notes

Groundwater: Damp at 1.50m bgl

Services: Prior to drilling the location was scanned with a cable avoidance tool (CAT).

Addition of water: None added

Casing diameter: 110mm

Date logged: 15/11/11

Status: Final

Borehole Record - Window Sample

Probehole Number: WS106

Project Number: 43938

Contract Name: Ellis Ashton Street

Client: Ian Fogarty Associates

Engineer: Simon Howard

Date Started: 10/11/2011

Date Completed: 10/11/2011

Elevation AOD (m): N/A

Co-ordinates: N/A

Drilling Equipment: Mini tracked window sampler rig



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SUBSURFACE PROFILE

SAMPLES AND IN-SITU TESTING

Depth (mbgl)	Legend	Description	Depth of Strata (mbgl)	Type	Depth (mbgl)	In-Situ Testing SPT / U100	Water Level (mbgl)	Monitoring Installation / Backfill
		MADE GROUND: Non re-inforced concrete.						
		MADE GROUND: Brown/grey gravelly fine to medium sand. Gravel is sub-angular to angular fine to medium of mixed lithology.	0.50					
1.0		MADE GROUND: Brown ashy gravel. Gravel is sub-angular to angular of clinker, concrete and brick.	1.00	ES	1.00			
		MADE GROUND: Brown slightly sandy gravel. Gravel is coarse sub-angular to angular of mudstone.	1.50	ES	1.70			
2.0		Soft low strength silty black CLAY with strong hydrocarbon/solvent odour and staining.	2.10	ES	2.30			
		Soft low strength silty gravelly CLAY. Gravel is sub-angular to sub-rounded fine to coarse of mixed lithology.	2.60	ES	2.90			
3.0		Very stiff very high strength grey MARL.		ES	3.50			
		Grey weathered MUDSTONE.	3.80					
4.0		Probehole terminated at 3.90m bgl due to refusal						
5.0								
6.0								

Key

B. Bulk (Bag)

W. Water

U100. 100mm Undisturbed

U38. 38mm Undisturbed Sample

SPT. Standard Penetration Test

D. Disturbed

G. Amber Glass Jar / Bottle

CPT. Cone Penetration Test

U100. Blows (Recovery mm)

V. 40ml Glass Vial

T. Plastic Tub

N. 'N' Value

HV. Hand Shear Vane

PID. Photo Ionisation Detector

ES. Environmental Sample

Notes

Groundwater: Groundwater encountered at 1.10m bgl

Services: Prior to drilling the location was scanned with a cable avoidance tool (CAT).

Addition of water: None added

Casing diameter: 110mm

Date logged: 15/11/11

Status: Final

Borehole Record - Window Sample

Probehole Number: WS201

Project Number: 43938

Contract Name: Ellis Ashton Street

Client: Ian Fogarty Associates

Engineer: Simon Howard

Date Started: 22/11/2012

Date Completed: 22/11/2012

Elevation AOD (m): N/A

Co-ordinates: N/A

Drilling Equipment: Mini tracked window sampler rig



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SUBSURFACE PROFILE

SAMPLES AND IN-SITU TESTING

Depth (mbgl)	Legend	Description	Depth of Strata (mbgl)	Type	Depth (mbgl)	In-Situ Testing SPT / U100	Water Level (mbgl)	Monitoring Installation / Backfill
1.0		MADE GROUND: Gravel/concrete cap.	1.00					
1.5		MADE GROUND: Grey gravelly fine to medium sand. Gravel is sub-angular to angular fine to medium of brick and concrete.	1.50					
2.0		MADE GROUND: Brown slightly sandy gravel. Gravel is sub-angular to sub-rounded medium to coarse of brick and concrete.	2.00					
2.8		Firm to stiff medium to high strength grey sandy gravelly CLAY. Gravel is sub-angular to sub-rounded fine to coarse of mixed lithology and discontinuous pockets of sand.	2.80					
3.0		No recovery.	3.00					
4.0		Coal onto MUDSTONE.						
4.0		Complete at 3.00m bgl.						
5.0								
6.0								

Key

B. Bulk (Bag)

W. Water

U100. 100mm Undisturbed

U38. 38mm Undisturbed Sample

SPT. Standard Penetration Test

D. Disturbed

G. Amber Glass Jar / Bottle

CPT. Cone Penetration Test

U100. Blows (Recovery mm)

V. 40ml Glass Vial

T. Plastic Tub

N. 'N' Value

HV. Hand Shear Vane

PID. Photo Ionisation Detector

ES. Environmental Sample

Notes

Groundwater: None encountered

Services: Prior to drilling the location was scanned with a cable avoidance tool (CAT).

Addition of water: None added

Casing diameter: 110mm

Date logged: 15/11/11

Status: Prelim1

Borehole Record - Window Sample

Probehole Number: WS202

Project Number: 43938

Contract Name: Ellis Ashton Street

Client: Ian Fogarty Associates

Engineer: Simon Howard

Date Started: 22/11/2012

Date Completed: 22/11/2012

Elevation AOD (m): N/A

Co-ordinates: N/A

Drilling Equipment: Mini tracked window sampler rig



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Tel: 0161 868 1300 / Fax: 0161 868 1301
www.recltd.co.uk

SUBSURFACE PROFILE

SAMPLES AND IN-SITU TESTING

Depth (mbgl)	Legend	Description	Depth of Strata (mbgl)	Type	Depth (mbgl)	In-Situ Testing SPT / U100	Water Level (mbgl)	Monitoring Installation / Backfill
		MADE GROUND: Gravel/concrete cap.	0.50					
1.0		MADE GROUND: Brown/grey slightly sandy gravel. Gravel is sub-angular medium to coarse of mixed lithology.	1.80					
2.0		Soft low strength black sandy organic CLAY. Organic material plant roots throughout.	2.00					
			2.25					
		Grey/brown gravelly fine to medium SAND. Gravel is sub-angular to sub-rounded fine to medium of mixed lithology.						
3.0		Soft brown/grey sandy CLAY. Sand is fine to medium.	3.50					
		Very soft brown sandy CLAY. Sand is fine to medium.	4.00					
4.0		Complete at 4.00m bgl.						
5.0								
6.0								

Key

B. Bulk (Bag)

W. Water

U100. 100mm Undisturbed

U38. 38mm Undisturbed Sample

SPT. Standard Penetration Test

D. Disturbed

G. Amber Glass Jar / Bottle

CPT. Cone Penetration Test

U100. Blows (Recovery mm)

V. 40ml Glass Vial

T. Plastic Tub

N. 'N' Value

HV. Hand Shear Vane

PID. Photo Ionisation Detector

ES. Environmental Sample

Notes

Groundwater: None encountered

Services: Prior to drilling the location was scanned with a cable avoidance tool (CAT).

Addition of water: None added

Casing diameter: 110mm

Date logged: 15/11/11

Status: Prelim1

Borehole Record - Window Sample

Probehole Number: WS203

Project Number: 43938

Contract Name: Ellis Ashton Street

Client: Ian Fogarty Associates

Engineer: Simon Howard

Date Started: 22/11/2012

Date Completed: 22/11/2012

Elevation AOD (m): N/A

Co-ordinates: N/A

Drilling Equipment: Mini tracked window sampler rig



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SUBSURFACE PROFILE

SAMPLES AND IN-SITU TESTING

Depth (mbgl)	Legend	Description	Depth of Strata (mbgl)	Type	Depth (mbgl)	In-Situ Testing SPT / U100	Water Level (mbgl)	Monitoring Installation / Backfill
		MADE GROUND: Concrete cap.	0.30					
1.0		MADE GROUND: Brown/grey slightly sandy gravel. Gravel is angular to sub-angular medium to coarse of mixed lithology.	1.70					
2.0		Soft low strength black sandy organic CLAY with some rootlets throughout.	2.00					
		Soft brown/grey sandy CLAY. Sand is fine to medium.	3.00					
3.0		Stiff to very stiff high strength brown gravelly CLAY. Gravel is sub-angular to sub-rounded fine to medium of mixed lithology.	4.00					
4.0		Complete at 4.00m bgl.						
5.0								
6.0								

Key

B. Bulk (Bag)

W. Water

U100. 100mm Undisturbed

U38. 38mm Undisturbed Sample

SPT. Standard Penetration Test

D. Disturbed

G. Amber Glass Jar / Bottle

CPT. Cone Penetration Test

U100. Blows (Recovery mm)

V. 40ml Glass Vial

T. Plastic Tub

N. 'N' Value

HV. Hand Shear Vane

PID. Photo Ionisation Detector

ES. Environmental Sample

Notes

Groundwater: None encountered

Services: Prior to drilling the location was scanned with a cable avoidance tool (CAT).

Addition of water: None added

Casing diameter: 110mm

Date logged: 15/11/11

Status: Prelim1

Borehole Record - Window Sample

Probehole Number: WS204

Project Number: 43938

Contract Name: Ellis Ashton Street

Client: Ian Fogarty Associates

Engineer: Simon Howard

Date Started: 22/11/2012

Date Completed: 22/11/2012

Elevation AOD (m): N/A

Co-ordinates: N/A

Drilling Equipment: Mini tracked window sampler rig



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SUBSURFACE PROFILE

SAMPLES AND IN-SITU TESTING

Depth (mbgl)	Legend	Description	Depth of Strata (mbgl)	Type	Depth (mbgl)	In-Situ Testing SPT / U100	Water Level (mbgl)	Monitoring Installation / Backfill
		MADE GROUND: Concrete cap.	0.30					
		MADE GROUND: Black/red slightly sandy gravel. Gravel is sub-angular to angular fine to coarse of brick, concrete and mixed lithology.						
1.0		MADE GROUND: Soft white solid material possibly Galigoo.						
			1.80					
2.0		MADE GROUND: Soft brown slightly sandy gravelly clay. Gravel is sub-angular to sub-rounded fine to medium of brick, concrete and mixed lithology.	2.00					
		MADE GROUND: Recovered soft brown slightly sandy gravelly clay. Gravel is sub-angular to sub-rounded fine to medium of brick, concrete and mixed lithology.						
3.0			3.00					
		Soft to firm brown sandy very gravelly CLAY with occasional thick sand lenses. Sand is fine to medium. Gravel is sub-angular to sub-rounded fine to medium of mixed lithology.	3.30					
4.0		Complete at 4.00m bgl.						
5.0								
6.0								

Key

B. Bulk (Bag)

W. Water

U100. 100mm Undisturbed

U38. 38mm Undisturbed Sample

SPT. Standard Penetration Test

D. Disturbed

G. Amber Glass Jar / Bottle

CPT. Cone Penetration Test

U100. Blows (Recovery mm)

V. 40ml Glass Vial

T. Plastic Tub

N. 'N' Value

HV. Hand Shear Vane

PID. Photo Ionisation Detector

ES. Environmental Sample

Notes

Groundwater: None encountered

Services: Prior to drilling the location was scanned with a cable avoidance tool (CAT).

Addition of water: None added

Casing diameter: 110mm

Date logged: 15/11/11

Status: Prelim1

Borehole Record - Window Sample

Probehole Number: WS205

Project Number: 43938

Contract Name: Ellis Ashton Street

Client: Ian Fogarty Associates

Engineer: Simon Howard

Date Started: 22/11/2012

Date Completed: 22/11/2012

Elevation AOD (m): N/A

Co-ordinates: N/A

Drilling Equipment: Mini tracked window sampler rig



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SUBSURFACE PROFILE

SAMPLES AND IN-SITU TESTING

Depth (mbgl)	Legend	Description	Depth of Strata (mbgl)	Type	Depth (mbgl)	In-Situ Testing SPT / U100	Water Level (mbgl)	Monitoring Installation / Backfill
		MADE GROUND: Concrete cap.	0.20					
1.0		MADE GROUND: Brown grey sandy clayey gravel. Gravel is sub-angular to angular of brick, concrete, ash and mixed lithology.	1.40					
2.0		Soft grey/brown sandy gravelly CLAY. Gravel is sub-angular to sub-rounded fine to medium.	2.00					
		Soft becoming firm brown/grey clay with traces of gravel. Gravel is sub-rounded to rounded, fine to medium.	2.40					
3.0		Soft/firm brown sandy gravelly CLAY. Gravel is sub-rounded fine to medium of mixed lithology.	4.00					
4.0		Complete at 4.00m bgl.						
5.0								
6.0								

Key

B. Bulk (Bag)

W. Water

U100. 100mm Undisturbed

U38. 38mm Undisturbed Sample

SPT. Standard Penetration Test

D. Disturbed

G. Amber Glass Jar / Bottle

CPT. Cone Penetration Test

U100. Blows (Recovery mm)

V. 40ml Glass Vial

T. Plastic Tub

N. 'N' Value

HV. Hand Shear Vane

PID. Photo Ionisation Detector

ES. Environmental Sample

Notes

Groundwater: None encountered

Services: Prior to drilling the location was scanned with a cable avoidance tool (CAT).

Addition of water: None added

Casing diameter: 110mm

Date logged: 15/11/11

Status: Prelim1

Borehole Record - Window Sample

Probehole Number: WS206

Project Number: 43938

Contract Name: Ellis Ashton Street

Client: Ian Fogarty Associates

Engineer: Simon Howard

Date Started: 22/11/2012

Date Completed: 22/11/2012

Elevation AOD (m): N/A

Co-ordinates: N/A

Drilling Equipment: Mini tracked window sampler rig



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SUBSURFACE PROFILE

SAMPLES AND IN-SITU TESTING

Depth (mbgl)	Legend	Description	Depth of Strata (mbgl)	Type	Depth (mbgl)	In-Situ Testing SPT / U100	Water Level (mbgl)	Monitoring Installation / Backfill
		MADE GROUND: Concrete cap.	0.30					
		MADE GROUND: Black/grey slightly sandy gravel. Gravel is sub-angular to angular medium to coarse of brick, concrete, ash and mixed lithology.	0.80					
1.0		Soft low strength black sandy gravelly CLAY with some rootlets. Gravel is sub-angular to sub-rounded of mixed lithology..	1.00					
2.0		Soft brown/grey sandy CLAY. Sand is fine to medium with rare sub-angular to sub-rounded gravel of mixed lithology.	2.50					
3.0		Firm to stiff high to very high strength grey gravelly CLAY. Gravel is sub-angular to sub-rounded fine to medium of coal, mudstone and mixed lithology.	3.00					
		Grey weathered MUDSTONE.	3.30					
4.0		Terminated at 3.30m bgl due to a refusal.						
5.0								
6.0								

Key

B. Bulk (Bag)

W. Water

U100. 100mm Undisturbed

U38. 38mm Undisturbed Sample

SPT. Standard Penetration Test

D. Disturbed

G. Amber Glass Jar / Bottle

CPT. Cone Penetration Test

U100. Blows (Recovery mm)

V. 40ml Glass Vial

T. Plastic Tub

N. 'N' Value

HV. Hand Shear Vane

PID. Photo Ionisation Detector

ES. Environmental Sample

Notes

Groundwater: None encountered

Services: Prior to drilling the location was scanned with a cable avoidance tool (CAT).

Addition of water: None added

Casing diameter: 110mm

Date logged: 15/11/11

Status: Prelim1

APPENDIX V
CHEMICAL TESTING



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

Scientific Analysis Laboratories Ltd

Certificate of Analysis

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

Report Number: 300992-1

Date of Report: 30-Oct-2012

Customer: Resource Environmental Consultants Ltd
Osprey House
Pacific Quay
Broadway
Salford
M50 2UE

Customer Contact: Mr Marcus Wright

Customer Job Reference: 43938

Customer Site Reference: Ellis Ashton Suite

Date Job Received at SAL: 23-Oct-2012

Date Analysis Started: 24-Oct-2012

Date Analysis Completed: 29-Oct-2012

The results reported relate to samples received in the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs



1549

Report checked
and authorised by :

Issued by :
Mr Ross Walker
Customer Services Manager
(Land)

Analysed as Soil

SAL Reference					300992 003	300992 005	300992 009	300992 010	300992 012	300992 014
Customer Sample Reference					WS202 - 1.7m (1)	WS203 - 1.4m (1)	WS204 - 3-3.2m (2)	WS204 - 1-1.8m	WS205 - 1.8m (2)	WS206 - 1.7m (1)
Date Sampled					22-OCT-2012	22-OCT-2012	22-OCT-2012	22-OCT-2012	22-OCT-2012	22-OCT-2012
Determinand	Method	Test Sample	LOD	Units						
Arsenic	T6	AR	1	mg/kg	14	11	5	4	6	8
Cadmium	T6	AR	1	mg/kg	<1	<1	<1	<1	<1	<1
Chromium	T6	AR	1	mg/kg	14	24	22	15	18	27
Lead	T6	AR	1	mg/kg	99	180	23	16	19	18
Mercury	T6	AR	1	mg/kg	<1	<1	<1	<1	<1	<1
Selenium	T6	AR	3	mg/kg	<3	<3	<3	<3	<3	<3
Copper	T6	AR	1	mg/kg	110	68	17	31	15	20
Nickel	T6	AR	1	mg/kg	17	20	22	5	16	31
Zinc	T6	AR	1	mg/kg	250	160	37	92	430	42
pH	T7	AR			7.2	7.8	7.7	12.3	9.7	8.0
SO4(Total)	T6	AR	0.01	%	0.17	0.21	0.10	2.3	0.14	0.02
SO4(2:1)	T6	AR	0.1	g/l	<0.1	<0.1	<0.1	0.3	<0.1	<0.1
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1	<1	<1
Phenols(Mono)	T4	AR	1	mg/kg	<1	<1	<1	<1	<1	<1
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1	<1

Analysed as Soil

Total and Speciated USEPA16 PAH

SAL Reference					300992 001	300992 003	300992 005	300992 006	300992 008	300992 010	300992 012	300992 014	300992 015
Customer Sample Reference					WS201 - (1)	WS202 - 1.7m (1)	WS203 - 1.4m (1)	WS203 - 1.7m (2)	WS204 - 1.2m (1)	WS204 - 1- 1.8m	WS205 - 1.8m (2)	WS206 - 1.7m (1)	WS206 - 3m (3)
Date Sampled					22-OCT-2012	22-OCT-2012	22-OCT-2012	22-OCT-2012	22-OCT-2012	22-OCT-2012	22-OCT-2012	22-OCT-2012	22-OCT-2012
Determinand	Method	Test Sample	LOD	Units									
Naphthalene	T149	AR	0.01	mg/kg	<0.01	0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.01
Acenaphthylene	T149	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	T149	AR	0.01	mg/kg	<0.01	0.01	<0.01	0.08	<0.01	<0.01	<0.01	<0.01	<0.01
Fluorene	T149	AR	0.01	mg/kg	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	T149	AR	0.01	mg/kg	<0.01	0.06	0.02	0.73	0.01	0.01	<0.01	<0.01	0.02
Anthracene	T149	AR	0.01	mg/kg	<0.01	0.01	0.01	0.21	<0.01	<0.01	<0.01	<0.01	0.01
Fluoranthene	T149	AR	0.01	mg/kg	<0.01	0.09	0.05	2.1	0.01	0.01	<0.01	<0.01	0.02
Pyrene	T149	AR	0.01	mg/kg	<0.01	0.08	0.05	2.0	<0.01	0.01	<0.01	<0.01	0.02
Benzo(a)Anthracene	T149	AR	0.01	mg/kg	<0.01	0.04	0.02	0.75	0.01	0.01	0.01	<0.01	0.01
Chrysene	T149	AR	0.01	mg/kg	<0.01	0.03	0.02	0.74	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b/k)Fluoranthene	T149	AR	0.01	mg/kg	<0.01	0.04	0.02	0.96	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)Pyrene	T149	AR	0.01	mg/kg	<0.01	0.02	0.01	0.59	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(123-cd)Pyrene	T149	AR	0.01	mg/kg	<0.01	0.02	0.02	0.47	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenzo(ah)Anthracene	T149	AR	0.01	mg/kg	<0.01	0.01	<0.01	0.11	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(ghi)Perylene	T149	AR	0.01	mg/kg	<0.01	0.02	0.01	0.53	<0.01	<0.01	<0.01	<0.01	<0.01
PAH(total)	T149	AR	0.01	mg/kg	<0.01	0.44	0.23	9.3	0.03	0.04	0.01	<0.01	0.09

Value	Description
AR	As Received
N.D.	Not Detected
13	Results have been blank corrected.
S	Analysis was subcontracted
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Method Index

Value	Description
T7	Probe
T85	Calc
T8	GC/FID
T27	PLM
T6	ICP/OES
T149	GC/MS (SIR)
T54	GC/MS (Headspace)
T4	Colorimetry
T21	OX/IR
T1	GC/MS (HR)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Asbestos ID	T27	AR			SU	001,005,008,011,014
Total Organic Carbon	T21	AR	0.1	%	N	006,009-010
PCB BZ#101	T1	AR	0.00005	mg/kg	U	010
PCB BZ#118	T1	AR	0.00005	mg/kg	U	010
PCB BZ#138	T1	AR	0.00005	mg/kg	U	010
PCB BZ#153	T1	AR	0.00005	mg/kg	U	010
PCB BZ#180	T1	AR	0.00005	mg/kg	U	010
PCB BZ#28	T1	AR	0.00005	mg/kg	U	010
PCB BZ#52	T1	AR	0.00005	mg/kg	U	010
Arsenic	T6	AR	1	mg/kg	U	003,005,009-010,012,014
Cadmium	T6	AR	1	mg/kg	U	003,005,009-010,012,014
Chromium	T6	AR	1	mg/kg	U	003,005,009-010,012,014
Lead	T6	AR	1	mg/kg	U	003,005,009-010,012,014
Mercury	T6	AR	1	mg/kg	U	003,005,009-010,012,014
Selenium	T6	AR	3	mg/kg	U	003,005,009-010,012,014
Copper	T6	AR	1	mg/kg	U	003,005,009-010,012,014
Nickel	T6	AR	1	mg/kg	U	003,005,009-010,012,014
Zinc	T6	AR	1	mg/kg	U	003,005,009-010,012,014
pH	T7	AR			U	003,005,009-010,012,014
SO4(Total)	T6	AR	0.01	%	N	003,005,009-010,012,014
SO4(2:1)	T6	AR	0.1	g/l	N	003,005,009-010,012,014
Cyanide(Total)	T4	AR	1	mg/kg	U	003,005,009-010,012,014
Phenols(Mono)	T4	AR	1	mg/kg	U	003,005,009-010,012,014
Chromium VI	T6	AR	1	mg/kg	N	003,005,009-010,012,014
TPH (C5-C6)	T54	AR	0.10	mg/kg	N	002,004-006,009,011
TPH (C6-C8)	T54	AR	0.1	mg/kg	N	002,004-006,009,011
TPH (C8-C10)	T54	AR	0.10	mg/kg	N	002,004-006,009,011
TPH (C10-C12)	T8	AR	1	mg/kg	U	002,004-006,009,011
TPH (C12-C16)	T8	AR	1	mg/kg	U	002,004-006,009,011
TPH (C16-C21)	T8	AR	1	mg/kg	U	002,004-006,009,011
TPH (C21-C35)	T8	AR	1	mg/kg	U	002,004-006,009,011
Methyl tert-Butyl Ether	T54	AR	0.001	mg/kg	U	012
TPH (C5-C6 aliphatic)	T54	AR	0.010	mg/kg	N	003,008,012,014
TPH (C6-C8 aliphatic)	T54	AR	0.010	mg/kg	N	003,008,012,014
TPH (C8-C10 aliphatic)	T54	AR	0.010	mg/kg	N	003,008,012,014
TPH (C10-C12 aliphatic)	T8	AR	1	mg/kg	N	003,008,012,014
TPH (C12-C16 aliphatic)	T8	AR	1	mg/kg	N	003,008,012,014
TPH (C16-C21 aliphatic)	T8	AR	1	mg/kg	N	003,008,012,014
TPH (C21-C35 aliphatic)	T8	AR	1	mg/kg	N	003,008,012,014
TPH (Aliphatic) total	T85	AR		mg/kg	N	003,008,012,014
TPH (C6-C7 aromatic)	T54	AR	0.010	mg/kg	N	003,008,012,014
TPH (C7-C8 aromatic)	T54	AR	0.010	mg/kg	N	003,008,012,014
TPH (C8-C10 aromatic)	T54	AR	0.010	mg/kg	N	003,008,012,014
TPH (C10-C12 aromatic)	T8	AR	1	mg/kg	N	003,008,012,014

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
TPH (C12-C16 aromatic)	T8	AR	1	mg/kg	N	003,008,012,014
TPH (C16-C21 aromatic)	T8	AR	1	mg/kg	N	003,008,012,014
TPH (C21-C35 aromatic)	T8	AR	1	mg/kg	N	003,008,012,014
TPH (Aromatic) total	T85	AR		mg/kg	N	003,008,012,014
TPH (Aliphatic+Aromatic) (sum)	T85	AR		mg/kg	N	003,008,012,014
Naphthalene	T149	AR	0.01	mg/kg	U	001,003,005-006,008,010,012,014-015
Acenaphthylene	T149	AR	0.01	mg/kg	U	001,003,005-006,008,010,012,014-015
Acenaphthene	T149	AR	0.01	mg/kg	U	001,003,005-006,008,010,012,014-015
Fluorene	T149	AR	0.01	mg/kg	U	001,003,005-006,008,010,012,014-015
Phenanthrene	T149	AR	0.01	mg/kg	U	001,003,005-006,008,010,012,014-015
Anthracene	T149	AR	0.01	mg/kg	U	001,003,005-006,008,010,012,014-015
Fluoranthene	T149	AR	0.01	mg/kg	U	001,003,005-006,008,010,012,014-015
Pyrene	T149	AR	0.01	mg/kg	U	001,003,005-006,008,010,012,014-015
Benzo(a)Anthracene	T149	AR	0.01	mg/kg	U	001,003,005-006,008,010,012,014-015
Chrysene	T149	AR	0.01	mg/kg	U	001,003,005-006,008,010,012,014-015
Benzo(b/k)Fluoranthene	T149	AR	0.01	mg/kg	U	001,003,005-006,008,010,012,014-015
Benzo(a)Pyrene	T149	AR	0.01	mg/kg	U	001,003,005-006,008,010,012,014-015
Indeno(123-cd)Pyrene	T149	AR	0.01	mg/kg	U	001,003,005-006,008,010,012,014-015
Dibenzo(ah)Anthracene	T149	AR	0.01	mg/kg	U	001,003,005-006,008,010,012,014-015
Benzo(ghi)Perylene	T149	AR	0.01	mg/kg	U	001,003,005-006,008,010,012,014-015
PAH(total)	T149	AR	0.01	mg/kg	U	001,003,005-006,008,010,012,014-015
1,1,1,2-Tetrachloroethane	T54	AR	0.005	mg/kg	U	002,006,010-011
1,1,1-Trichloroethane	T54	AR	0.005	mg/kg	U	002,006,010-011
1,1,2,2-Tetrachloroethane	T54	AR	0.005	mg/kg	U	002,006,010-011
1,1,2-Trichloroethane	T54	AR	0.005	mg/kg	U	002,006,010-011
1,1,2-Trichloroethylene	T54	AR	0.005	mg/kg	U	002,006,010-011
1,1-Dichloroethane	T54	AR	0.005	mg/kg	U	002,006,010-011
1,1-Dichloroethylene	T54	AR	0.005	mg/kg	U	002,006,010-011
1,1-Dichloropropene	T54	AR	0.005	mg/kg	U	002,006,010-011
1,2,3-Trichloropropane	T54	AR	0.005	mg/kg	U	002,006,010-011
1,2,4-Trimethylbenzene	T54	AR	0.005	mg/kg	U	002,006,010-011
1,2-dibromoethane	T54	AR	0.005	mg/kg	U	002,006,010-011
1,2-Dichlorobenzene	T54	AR	0.005	mg/kg	U	002,006,010-011
1,2-Dichloroethane	T54	AR	0.005	mg/kg	U	002,006,010-011
1,2-Dichloropropane	T54	AR	0.005	mg/kg	U	002,006,010-011
1,3,5-Trimethylbenzene	T54	AR	0.005	mg/kg	U	002,006,010-011
1,3-Dichlorobenzene	T54	AR	0.005	mg/kg	U	002,006,010-011
1,3-Dichloropropane	T54	AR	0.005	mg/kg	U	002,006,010-011
1,4-Dichlorobenzene	T54	AR	0.005	mg/kg	U	002,006,010-011
2,2-Dichloropropane	T54	AR	0.005	mg/kg	U	002,006,010-011
2-Chlorotoluene	T54	AR	0.005	mg/kg	U	002,006,010-011
4-Chlorotoluene	T54	AR	0.005	mg/kg	U	002,006,010-011
Benzene	T54	AR	0.001	mg/kg	U	002,006,010-012
Bromobenzene	T54	AR	0.005	mg/kg	U	002,006,010-011
Bromochloromethane	T54	AR	0.005	mg/kg	U	002,006,010-011
Bromodichloromethane	T54	AR	0.005	mg/kg	U	002,006,010-011
Bromoform	T54	AR	0.005	mg/kg	U	002,006,010-011
Bromomethane	T54	AR	0.005	mg/kg	U	002,006,010-011
Carbon tetrachloride	T54	AR	0.005	mg/kg	U	002,006,010-011
Chlorobenzene	T54	AR	0.005	mg/kg	U	002,006,010-011
Chlorodibromomethane	T54	AR	0.005	mg/kg	U	002,006,010-011
Chloroethane	T54	AR	0.005	mg/kg	U	002,006,010-011
Chloroform	T54	AR	0.005	mg/kg	U	002,006,010-011
Chloromethane	T54	AR	0.005	mg/kg	U	002,006,010-011
Cis-1,2-Dichloroethylene	T54	AR	0.005	mg/kg	U	002,006,010-011
Cis-1,3-Dichloropropene	T54	AR	0.005	mg/kg	U	002,006,010-011
Dibromomethane	T54	AR	0.005	mg/kg	U	002,006,010-011
Dichlorodifluoromethane	T54	AR	0.005	mg/kg	U	002,006,010-011
Dichloromethane	T54	AR	0.050	mg/kg	N	002,006,010-011
Ethyl/Benzene	T54	AR	0.001	mg/kg	U	002,006,010-012
Isopropyl benzene	T54	AR	0.005	mg/kg	U	002,006,010-011
M/P Xylene	T54	AR	0.001	mg/kg	U	002,006,010-012
n-Propylbenzene	T54	AR	0.005	mg/kg	U	002,006,010-011
O Xylene	T54	AR	0.001	mg/kg	U	002,006,010-012
p-Isopropyltoluene	T54	AR	0.005	mg/kg	U	002,006,010-011
S-Butylbenzene	T54	AR	0.005	mg/kg	U	002,006,010-011
Styrene	T54	AR	0.005	mg/kg	U	002,006,010-011
T-Butylbenzene	T54	AR	0.005	mg/kg	U	002,006,010-011
Tetrachloroethene	T54	AR	0.005	mg/kg	U	002,006,010-011
Toluene	T54	AR	0.001	mg/kg	U	002,006,010-012

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Trans-1,2-Dichloroethene	T54	AR	0.005	mg/kg	U	002,006,010-011
Trans-1,3-Dichloropropene	T54	AR	0.005	mg/kg	U	002,006,010-011
Trichlorofluoromethane	T54	AR	0.005	mg/kg	U	002,006,010-011
Vinyl chloride	T54	AR	0.005	mg/kg	U	002,006,010-011





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Certificate of Analysis

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M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: 302370-1

Date of Report: 08-Nov-2012

Customer: Resource Environmental Consultants Ltd
Osprey House
Pacific Quay
Broadway
Salford
M50 2UE

Customer Contact: Mr Marcus Wright

Customer Job Reference:

Customer Site Reference: Ashton Street

Date Job Received at SAL: 01-Nov-2012

Date Analysis Started: 05-Nov-2012

Date Analysis Completed: 07-Nov-2012

The results reported relate to samples received in the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs



1549

Report checked
and authorised by :
Mr Ross Walker
Customer Services Manager
(Land)

Issued by :
Mr Ross Walker
Customer Services Manager
(Land)

Value	Description
AR	As Received
N.D.	Not Detected
13	Results have been blank corrected.
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Method Index

Value	Description
T149	GC/MS (SIR)
T1	GC/MS (HR)
T215	GC/MS (Headspace)(LV)
T54	GC/MS (Headspace)
T85	Calc
T81	GC/FID (LV)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
PCB (Total Tri-Hepta)	T1	AR	0.005	µg/l	U	005
TPH (C5-C6 aliphatic)	T215	AR	10	µg/l	N	001-008
TPH (C6-C8 aliphatic)	T215	AR	10	µg/l	N	001-008
TPH (C8-C10 aliphatic)	T215	AR	10	µg/l	N	001-008
TPH DW(C10-C12 aliphatic)	T81	AR	10	µg/l	N	001-008
TPH DW(C12-C16 aliphatic)	T81	AR	10	µg/l	N	001-008
TPH DW(C16-C21 aliphatic)	T81	AR	10	µg/l	N	001-008
TPH DW(C21-C35 aliphatic)	T81	AR	10	µg/l	N	001-008
TPH (Aliphatic) total	T85	AR		µg/l	N	001-008
TPH (C6-C7 aromatic)	T215	AR	10	µg/l	N	001-008
TPH (C7-C8 aromatic)	T215	AR	10	µg/l	N	001-008
TPH (C8-C10 aromatic)	T215	AR	10	µg/l	N	001-008
TPH DW(C10-C12 aromatic)	T81	AR	10	µg/l	N	001-008
TPH DW(C12-C16 aromatic)	T81	AR	10	µg/l	N	001-008
TPH DW(C16-C21 aromatic)	T81	AR	10	µg/l	N	001-008
TPH DW(C21-C35 aromatic)	T81	AR	10	µg/l	N	001-008
TPH (Aromatic) total	T85	AR		µg/l	N	001-008
TPH (Aliphatic+Aromatic) (sum)	T85	AR		µg/l	N	001-008
Naphthalene	T149	AR	0.01	µg/l	U	001-006,008
Acenaphthylene	T149	AR	0.01	µg/l	U	001-006,008
Acenaphthene	T149	AR	0.01	µg/l	U	001-006,008
Fluorene	T149	AR	0.01	µg/l	U	001-006,008
Phenanthrene	T149	AR	0.01	µg/l	U	001-006,008
Anthracene	T149	AR	0.01	µg/l	U	001-006,008
Fluoranthene	T149	AR	0.01	µg/l	U	001-006,008
Pyrene	T149	AR	0.01	µg/l	U	001-006,008
Benzo(a)Anthracene	T149	AR	0.01	µg/l	U	001-006,008
Chrysene	T149	AR	0.01	µg/l	U	001-006,008
Benzo(b/k)Fluoranthene	T149	AR	0.01	µg/l	U	001-006,008
Benzo(a)Pyrene	T149	AR	0.01	µg/l	U	001-006,008
Indeno(123-cd)Pyrene	T149	AR	0.01	µg/l	U	001-006,008
Dibenzo(ah)Anthracene	T149	AR	0.01	µg/l	U	001-006,008
Benzo(ghi)Perylene	T149	AR	0.01	µg/l	U	001-006,008
PAH(total)	T149	AR	0.01	µg/l	U	001-006,008
1,1,1,2-Tetrachloroethane	T54	AR	1	µg/l	U	001-003,006-008
1,1,1-Trichloroethane	T54	AR	1	µg/l	U	001-003,006-008
1,1,2,2-Tetrachloroethane	T54	AR	1	µg/l	U	001-003,006-008
1,1,2-Trichloroethane	T54	AR	1	µg/l	U	001-003,006-008
1,1,2-Trichloroethylene	T54	AR	1	µg/l	U	001-003,006-008
1,1-Dichloroethane	T54	AR	1	µg/l	U	001-003,006-008
1,1-Dichloroethylene	T54	AR	1	µg/l	U	001-003,006-008
1,1-Dichloropropene	T54	AR	1	µg/l	U	001-003,006-008
1,2,3-Trichloropropane	T54	AR	1	µg/l	U	001-003,006-008
1,2,4-Trimethylbenzene	T54	AR	1	µg/l	U	001-003,006-008
1,2-dibromoethane	T54	AR	1	µg/l	U	001-003,006-008
1,2-Dichlorobenzene	T54	AR	1	µg/l	U	001-003,006-008
1,2-Dichloroethane	T54	AR	1	µg/l	U	001-003,006-008
1,2-Dichloropropane	T54	AR	1	µg/l	U	001-003,006-008
1,3,5-Trimethylbenzene	T54	AR	1	µg/l	U	001-003,006-008

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
1,3-Dichlorobenzene	T54	AR	1	µg/l	U	001-003,006-008
1,3-Dichloropropane	T54	AR	1	µg/l	U	001-003,006-008
1,4-Dichlorobenzene	T54	AR	1	µg/l	U	001-003,006-008
2,2-Dichloropropane	T54	AR	1	µg/l	U	001-003,006-008
2-Chlorotoluene	T54	AR	1	µg/l	U	001-003,006-008
4-Chlorotoluene	T54	AR	1	µg/l	U	001-003,006-008
Benzene	T54	AR	1	µg/l	U	001-003,006-008
Bromobenzene	T54	AR	1	µg/l	U	001-003,006-008
Bromochloromethane	T54	AR	1	µg/l	U	001-003,006-008
Bromodichloromethane	T54	AR	1	µg/l	U	001-003,006-008
Bromoform	T54	AR	1	µg/l	U	001-003,006-008
Bromomethane	T54	AR	1	µg/l	U	001-003,006-008
Carbon tetrachloride	T54	AR	1	µg/l	U	001-003,006-008
Chlorobenzene	T54	AR	1	µg/l	U	001-003,006-008
Chlorodibromomethane	T54	AR	1	µg/l	U	001-003,006-008
Chloroethane	T54	AR	1	µg/l	U	001-003,006-008
Chloroform	T54	AR	1	µg/l	U	001-003,006-008
Chloromethane	T54	AR	1	µg/l	U	001-003,006-008
Cis-1,2-Dichloroethylene	T54	AR	1	µg/l	U	001-003,006-008
Cis-1,3-Dichloropropene	T54	AR	1	µg/l	U	001-003,006-008
Dibromomethane	T54	AR	1	µg/l	U	001-003,006-008
Dichlorodifluoromethane	T54	AR	1	µg/l	U	001-003,006-008
Dichloromethane	T54	AR	50	µg/l	N	001-003,006-008
EthylBenzene	T54	AR	1	µg/l	U	001-003,006-008
Isopropyl benzene	T54	AR	1	µg/l	U	001-003,006-008
M/P Xylene	T54	AR	1	µg/l	U	001-003,006-008
n-Propylbenzene	T54	AR	1	µg/l	U	001-003,006-008
O Xylene	T54	AR	1	µg/l	U	001-003,006-008
p-Isopropyltoluene	T54	AR	1	µg/l	U	001-003,006-008
S-Butylbenzene	T54	AR	1	µg/l	U	001-003,006-008
Styrene	T54	AR	1	µg/l	U	001-003,006-008
T-Butylbenzene	T54	AR	1	µg/l	U	001-003,006-008
Tetrachloroethene	T54	AR	1	µg/l	U	001-003,006-008
Toluene	T54	AR	1	µg/l	U	001-003,006-008
Trans-1,2-Dichloroethene	T54	AR	1	µg/l	U	001-003,006-008
Trans-1,3-Dichloropropene	T54	AR	1	µg/l	U	001-003,006-008
Trichlorofluoromethane	T54	AR	1	µg/l	U	001-003,006-008
Vinyl chloride	T54	AR	1	µg/l	U	001-003,006-008



APPENDIX VI
ORIGIN OF TIER I VALUES

ORIGIN OF REC TIER I VALUES

Constituent	Origin of Risk Assessment Value
Arsenic	2009 SGV
Cadmium	LQM CIEH 2 nd Edition 2009
Chromium	LQM CIEH 2 nd Edition 2009
Lead	Residential Half 2003 EA SGV based on planned target blood lead level reduction to 5µg/l. Commercial Calculated using commercial exposure equation within lead SGV 2003 with revised input data from HPA and taking proposed blood lead levels into account.
Mercury	2009 SGV
Nickel	2009 SGV
Selenium	Soil guideline value, DEFRA/Environment Agency
Copper	LQM CIEH 2 nd Edition 2009
Zinc	LQM CIEH 2 nd Edition 2009
Cyanide - Total	CLEA 1.06 Derived Value
Phenols - Total.	LQM CIEH 2 nd Edition 2009 – 1% SOM
Naphthalene	General Assessment Criteria (GAC) developed by CIEH / LQM the using CLEA 1-06 with supporting data from SR3, SR7 and existing Tox report where applicable. 1% SOM
Acenaphthylene	
Acenaphthene	
Fluorene	
Phenanthrene	
Anthracene	
Fluoranthene	
Pyrene	
Benzo(a)Anthracene ⁽ⁱ⁾	
Chrysene	
Benzo(b/k)Fluoranthene ⁽ⁱⁱⁱ⁾	
Benzo(a)Pyrene	
Indeno(123-cd)Pyrene	
Dibenzo(a,h)Anthracene	
Benzo(ghi)Perylene	
TPH C ₅ -C ₆ (aliphatic)	
TPH C ₆ -C ₈ (aliphatic)	
TPH C ₈ -C ₁₀ (aliphatic)	
TPH C ₁₀ -C ₁₂ (aliphatic)	
TPH C ₁₂ -C ₁₆ (aromatic)	
TPH C ₁₆ -C ₂₁ (aromatic)	
TPH C ₂₁ -C ₃₅ (aromatic)	

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COMPLETE PDF COPY OF REC REPORT

Ref: 03c43938
Date: 21 August 2015

Chris Flanagan
Planning Monitoring Officer
Knowsley Council
Yorkon Building
Archway Road
Huyton
L36 9FB

BY Email : chris.flanagan@knowsley.gov.uk

Dear Chris,

**TOWN AND COUNTRY PLANNING ACT 1990
APPLICATION: 13/00472/FUL**

PROPOSAL: APPLICATION TO VARY CONDITION 2 ATTACHED TO PLANNING APPLICATION 11/00117/FUL (CHANGE OF USE OF THE SITE FROM B2 (GENERAL INDUSTRY) TO B8 (STORAGE OR DISTRIBUTION) WITH ANCILLARY OFFICES, ERECTION OF BUILDING FOR THE STORAGE OF TIMBER (USE CLASS B8) TOGETHER WITH ASSOCIATED CAR PARKING) TO ALLOW FOR REVISIONS TO APPROVED PLANS TO ALLOW FOR ALTERATIONS TO THE APPROVED HIGHWAY ACCESS ARRANGEMENTS TO CREATE AN ENTRY ONLY & EXIT ONLY ACCESS POINTS ONTO ELLIS ASHTON STREET RESULTING IN A REDUCTION IN THE NUMBER OF OPERATIONAL HIGHWAY ACCESSES FOR THE SITE.

Further to your email dated 10th August 2015 REC have reviewed the comments issued with regards to discharging Condition 2: Contamination, for the above Planning Application.

Background

Resource and Environmental Consultants Ltd (REC) were initially commissioned to undertake a Phase I GeoEnvironmental Site Assessment (REC Ref 43938p1r0 March 2011) of land at Ellis Ashton Road, Huyton.

The report was required to determine potential contaminated land liabilities associated with the freehold interests of the property. The report assumed a continued commercial/industrial use. The site will be used as a vented storage building for maturing hard wood timber with separate offices in existing buildings. The development will occupy the same building footprint as the previous occupants, with the concrete slab retained. The new structure will be a vented-to-atmosphere, steel framed and metal clad unit.

Following the completion of the Phase I Assessment REC were commissioned to undertake a Phase II Geo-Environmental Site Investigation at the site (REC ref: 43938p2r0) completed October 2011.

The Phase II Investigation was carried out on the western side only, following agreement with Knowsley Council, to permit construction to begin on a steel framed building that was to be placed on the existing concrete pad (Geo- Environmental Site Investigation, REC Ref: 43939p2r0, November 2011).

During the undertaking of the REC Assessments, REC submitted the reports to Knowsley Council and the Environment Agency for review and comment. Comments were received from Rachel Evans (Knowsley Council) and from the Environment Agency. REC responded to Knowsley Council's comments on 22 February and the EA in April 2012.

The second phase was carried out on the western side only, following agreement with Knowsley MBC, to permit construction to begin on a steel framed building that was to be placed on the existing concrete pad (Geo- Environmental Site Investigation, REC Ref: 43939p2r0, November 2011).

As part of the Environment Agency's review of the November 2011 report it was recommended that additional trial pits were required around WS106 to delineate and quantify the nature of hydrocarbon impact identified within the soils and TCE concentrations within WS102. The results of this investigation are included in the letter dated 11 April 2012 (REC ref: 01c43938). Trial Pits TP101, TP102, TP103 and TP105 were excavated to investigate the elevated TPH recorded in WS106 which was thought to be potentially mobile and of possible diesel origin. No intrusive works were undertaken in the vicinity of WS102 due to the presence of asbestos in the soils along with limited solvent concentrations. The results of the trial pits around WS106 indicate that there is no up gradient source migrating through WS106 and south beneath the existing slab. In addition there was no evidence of the TPH recorded in WS106 migrating down gradient.

A further ground investigation was undertaken by REC following comments from the Environment Agency issued to Knowsley Council 01 May 2012 (EA Ref: SO/2012/110113/03-L01) and the findings of which are contained within Phase II Geo-Environmental Site Investigation Eastern Side (REC Ref: 43938p3r0), issued December 2012.

This third stage of investigation has been carried out on the eastern side of the site to complete the site characterisation required to satisfy the planning process and further investigate the concentration of TCE in the groundwater in the south of the site. It is understood that construction has been completed on an atmosphere vented storage unit which is used to dry timber on the former factory location on the western section of the site. There were no proposed plans to develop the eastern section of the site during this investigation.

The original site investigation was designed to assess the proposed development comprising a new vented building upon the existing concrete floor slab and conversely of all external areas with hardstanding. The pathways for the majority of contaminants for human health would be removed during the construction of the proposed development.

The outstanding issues related to controlled waters and as such, supplementary works were conducted. It should be noted that REC had considered that all queries the planning consultees had raised, had been resolved and as such receiving fresh comments 3 years later is disappointing. Please find below REC comments in relation to the order in which they were raised in the most recent correspondence.

1. Confirmation whether the contaminated ground referred to in section 4.0 of the 1991 Cremer & Warner report has been removed. Section 3.1.1 of the report stated 'sandy clays beneath boreholes BH3 - BH6 and BH8 - BH12 were observed to be contaminated by a black, odorous, oily liquid which extended to a depth of 4m bgl. In addition elevated concentrations of a number of heavy metals were recorded within soil samples recovered from boreholes BH4, BH10 and BH14. Section 4.0 of the 1991 report recommended this contaminated ground was removed including the area impacted by heavy metals. However, none of the later reports appear to address this source of contamination or indicate the contaminated ground has been removed. Additionally no further site investigation works have been completed within this area since 1991 apart from one borehole MW400 installed by Geotron in 2006, but no data associated with this borehole has been provided to date.

REC do not have access to this report and do not appear to have been issued with it during the undertaking of the two Ground Investigations, Phase I Desk Study and Additional Trial Pitting. As a such REC are unable to clarify the questions asked.

REC has undertaken investigation works down gradient of MW400 which indicate no migration of contamination across the site. REC also undertook an additional trial pitting exercise in April 2012 to assess the TPH contamination encountered in WS106

2. Confirm the former substances stored within the tanks located on the western boundary and whether the tanks have been removed and the relevant areas investigated. The information provided to date indicates the most southerly tank contained diesel. However, it is unclear what substances were stored within the other tanks located north of the former diesel AST.

As discussed above a trial pitting investigation was undertaken in the area immediately down gradient of the tanks and the concentrations encountered were deemed not to pose a risk to human health or controlled waters. The area immediately down gradient of the tanks was investigated via TP102, WS106 and TP105

REC Stated in the Phase I Geoenvironmental Site Assessment that: *'A question remains over the use and possible impact from solvents on the site but there are no records or reports of any incidents and no indication as to where it may have been stored.'*

REC are unable to confirm the contents of the tanks. It is understood by REC that these tanks were removed during the initial phase of demolition works which was being undertaken during the Phase I Walkover (see page 3 of 473938p1r0) in which REC comment *'Demolition of buildings is currently underway. This includes the removal of at least 5 large vertical tanks which have been set aside.'*

The area immediately down gradient of the tanks was investigated via TP102, WS106 and TP105.

3. Confirm whether additional site investigation works have been completed in the vicinity of borehole WS102 as detailed within the letter dated 11th April 2012 on page 4 which stated that 'additional testing will be completed in this area during the excavation of foundation pits'. A groundwater sample recovered from borehole WS102 previously recorded 31ug/l trichloroethylene in 2011 and to date we do not appear to have received any further information to indicate additional site investigation works have been completed within the vicinity of borehole WS102.

Following on from the letter dated April 2012 REC were commissioned to undertake an additional investigation within the Eastern Section of the site (REC Ref 43938p3r0 report is attached). The rationale behind this investigation is shown below:

'The revised CSM as set out in 43938p2r0 identified exceedances of Tier 1 values for metals in the shallow Made Ground but no associated risk as the site was to remain capped. The CSM also identified a potential risk to groundwater from TCE and some dissolved metals. The metals were discounted as a risk based on the low concentration present and the distance to any receptor. This phase of investigation is designed to further investigate the impact of TCE and any fuel/lubricant/transformer associated hydrocarbons. In addition, exploratory holes have also been advanced to provide information on baseline conditions across all the eastern side of the site and downgradient boundaries'.

When REC attended site it was noted that in the time between the two ground investigations WS102 had been destroyed. However, groundwater from MW309, down gradient of WS102 was sampled and found to be below method detection limit for all contaminants of concern. Additionally WS201 is positioned down gradient of WS102 and indicated no TCE above detection. As such REC consider that the minor elevation in TCE recorded in WS102 is not migrating off site and is not a risk to the nearest surface water feature (Longwood Mill Brook) located 55m east of the site.

4. Confirm whether additional works have been completed within the vicinity of borehole WS104 which previously recorded elevated concentrations of heavy metals within the soil sample recovered from this location as detailed within the letter dated 11th April 2012 on page 2 which stated 'further work will be completed to the north of this location once demolition is complete'. To date, we do not appear to have received any information to indicate additional site investigation works have been completed within the vicinity of borehole WS104.

REC understand that this area has not undergone demolition works and the buildings to the North have been retained.

An additional investigation was undertaken on site in 2012 as detailed in REC Report 439838p3r0. This included the Eastern part of the site primarily but also considered the findings of the CSM as summarised below:

'The revised CSM as set out in 43938p2r0 identified exceedances of Tier 1 values for metals in the shallow Made Ground but no associated risk as the site was to remain capped.'

The presence of elevated Heavy metals in WS104 was considered in REC's opinion to be a low risk to human health as this area will remain under hardstanding and as such no pathways are present. With regards to controlled waters, the nearest surface water receptor is 55m to the East of the site and subsequent ground water monitoring and sampling has not indicated elevated heavy metal constituents within boreholes down gradient of WS104.

5. Confirm why limited site investigation work has been completed within the north west part of the site were no boreholes appear to have been installed and confirm any potentially contaminative uses which may have occurred within this area. We note two former buildings are present within this area. It is unclear what these buildings have been utilised for and whether the previous uses may potentially have impacted the soil and/or groundwater.

The northwest area of the site has had limited investigation works as this was not included within the scope of works regarding the redevelopment of the site. It was not the intention of the site investigation to characterise the entire site, only the area relating to the proposed construction under planning.

Investigations undertaken down gradient of the northwest of the site did not indicate that this area as a potential source of contamination and as such was not investigated.

The two buildings noted by the consultee are still to REC's knowledge on site and are proposed to be used as 'Additional Timber Storage'. As stated in the Phase I report (REC Ref 43938p1r0) the exact use of these buildings was made available to REC during the development of the report. It was interpreted that they had been used for maintenance and repair of vehicles onsite. As such small amounts of oils and solvents may have been used. Access to these buildings was not possible during the walkover (see page 11 of 4439838p1r0) and as such it was not possible to confirm their use.

The objective of the Phase I Study and two Phase II Ground Investigations and additional Trial Pitting (undertaken at the request of the EA) was to assess the area where the atmosphere vented timber store would be constructed on the existing concrete slab. Down gradient sampling does not indicate any mobile contaminants.

6. Confirmation why the 'white substance' with a pH of 12.4 identified at borehole WS204 has been identified as 'galligu waste' as detailed within section 5.1 of the Phase II Geo-Environmental Site Investigation dated December 2012. Galligu waste is typically associated with elevated concentrations of heavy metals. However, a review of the analytical results from the soil sample recovered from this location did not identify elevated concentrations of heavy metals. Given the former use of the site it would appear likely that this 'white substance' maybe associated with the former coatings and ink substances used on site.

It was in REC's professional opinion that this substance could have been 'galligu waste', this was not a definitive statement and no samples were analysed to prove either way. REC note the consultees comments.

The main issue for the future development and potentially controlled water is the elevated pH of the sample. However, no down gradient wells indicated an elevated pH, suggesting the material is not mobile and is isolated in this one hotpsot. With regards to future development the pH will influence the design and selection of material used within below ground structures and utilities.

7. Provision of 2006 Geotron report including any available laboratory analytical data and borehole logs. The Phase II Geo-Environmental Site Investigation dated December 2012 makes reference to eight probholes (MW302 – MW304, MW307- MW309 and MW400 – MW401) installed in 2006 with groundwater samples recovered in 2012 from boreholes MW304 and MW309. To date we do not appear to have been provided with a copy of the 2006 Geotron report.

REC does not have access to this report. However they were identified during the site walkover and as they were considered suitable were used to obtain groundwater samples. Labels attached to each borehole identified the installation depth and construction.

8. For the purposes of the Tier 1 assessment REC we have compared the laboratory test data directly to the relevant Tier 1 GAC value for the protection of human health and controlled waters. The results of this direct comparison indicate that:

- The Made Ground contains metals and organics at concentrations that would be unacceptable in landscaped areas but not beneath hard standing for commercial developments; and
 - The only mobile organic contaminant in groundwater is TCE which is present at low concentrations which is indicative of a small low concentration source which should not pose a significant risk to controlled waters.
 - Asbestos was identified at one location in the Made Ground. Any excavation works in this area will require a detailed method statement and risk assessment prior to works commencing.
- We therefore would like to request the following:

- They need to check the above statement as from the results they have submitted in this report we don't believe it is correct.

Are Knowsley Council or the consultee able to provide clarification on this statement? It is particularly broad sweeping and does not help us to provide a solution or answer which will enable discharge of the Condition. What do they believe is incorrect?

In REC's opinion all three parts are correct as detailed below:

-  Made Ground encountered at the site was assessed to be below GAC for commercial end use with the exception of an isolated Lead, Chromium and pH. The exposure pathway of all contaminants encountered is from soil ingestion and dermal contact. Given that the entire site was proposed to be covered by Hardstanding, REC deemed there to be no risk
-  The Supplementary Geo-Investigation (43938p3r0) was undertaken after liaising with the EA. The report concluded that the TCE was not detected above Method Detection limit (MDL) and does not represent a risk to controlled waters.
-  Asbestos was only recorded in one sample out of eight tested (WS102). WS102 was within an area of external hardstanding. No excavations or below ground works were undertaken in this area as the hotspot was covered by the placement of concrete.

- Also, the information on page 7 states that one location had asbestos present, however the results in the laboratory certificates say none detected.

Page 7 of REC report 43938p3r0 is a summary of all previous reports issued and the pertinent information they contain. The reference to Asbestos being found is in fact in relation to the previous site investigation and report (REC ref 43938p2r0) where Asbestos was identified within WS102.

The laboratory certificates are included in the appendix of REC Report 43938p2r0.

- The asbestos results, whether detected or non detected, should have been included in the summary tables.

Noted. Apologies for any uncertainty this omission has caused to the reviewer.

Yours sincerely,

For and behalf of REC Ltd

Reviewed and Authorised

Yours sincerely



Vicky Timson
Principal Consultant

Yours sincerely



Rebecca Paul
Associate Director