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**Phase 1 Investigation
For A Proposed Development
On Land Adjacent To
9 Taylors Lane,
Bolton
BL2 6QS**

On Behalf of Ms Haslam

Jo Matthew BSc (Hons) MSc

Date: February 2013

Report QA No. 13016

QA Auditor: Paul Palgrave Bsc (Hons) ARSM MSc C. Geol FGS

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1.0 INTRODUCTION

This report describes a Phase 1 Investigation undertaken on behalf of Ms Elizabeth Haslam (The 'Client') on a site located at 9 Taylors Lane, Bolton, BL2 6QS.

It is understood that the Client intends to redevelop the site with a residential dwelling, stables and associated facilities and the formation of a manege. This report is intended to support the planning application for the new development.

The key objectives of this desk study are to identify any potentially significant constraints to redevelopment of the site due to the environmental setting and condition of the site and the surrounding area.

This report is based upon observations made on site during a walkover undertaken on 20 February 2013 and upon archival research including the analysis of historical maps, geological and hydrological data and other relevant Third Party environmental information that Peak Associates have taken to be correct, and no liability can be accepted for any inaccuracies contained within the Third Party information referenced.

This report has been produced on behalf of the Client, and no responsibility is accepted to any Third Party for all or any part. This report should not be relied upon or transferred to any other parties without the express written authorisation of Peak Associates. If any unauthorised Third Party comes into possession of this report, they rely on it at their own risk and the authors owe them no duty of care or skill.

3.0 SITE DESCRIPTION

The site comprises an irregular shaped plot of land of 0.37 hectares, located in Taylors Lane, Bolton. (BL2 6QS, NGR 375770 409290), as shown on Plan 1 (Appendix 1). Plan 2 (Appendix 2) shows the locations of key features observed on site. A selection of photographs of key features observed on site is presented in Appendix 3.

The site comprises a large single storey building (22m x 5m, photo 1) adjacent to the western site boundary and four paddocks used for keeping horses. The building is used for stabling horses (southern half) and restoring old cars (northern half) and has reportedly been used in the past to keep poultry. The building is constructed from breeze blocks with bricks cladding the exterior to half height (approximately 1m) and wooden cladding above. The roof is constructed from corrugated asbestos cement sheets, cracked and patched in places. The floor comprises a concrete slab, which appeared to be in reasonable condition. No staining was observed associated with the storage of cars. Access to the building is via a rolling aluminium door.

With the exception of the building, the site is surfaced with soft ground. The ground was observed to be wet and very muddy, where horses have torn it up (photo 2). The ground immediately adjacent to the building has been lowered by approximately 1m to prevent surface water from running into the building (photo 3), and the removed soil is stockpiled in long mounds in the paddocks adjacent to the building. The mounded soil appeared clean and clay-rich (photo 4).

A horse box is parked on site, near the site entrance (photo 5). No oil staining was observed associated with it. Various piles of debris were observed during the walkover, which will require removal prior to development works in accordance with the waste regulations.

The site is bounded to the east and west by residential properties (photo 6) and to the north and south by grassy pasture.

The site boundaries comprise post and rail or stock-proof fencing to the north, east and south, and to the west by a Leylandii hedge.

The site is located near the crest of a hill and the surrounding land slopes down to the west and south.

4.0 SITE HISTORY

A review of the site history has been undertaken in order to identify any previous potentially significantly contaminative uses, located either on-site, or in the surrounding area.

Potential on-site contamination sources may present a risk to future users of the site, and also off-site receptors, potentially including controlled waters.

Neighbouring potentially contaminative activities may present a risk to the site through on site migration of contamination, or through the deposition of waste materials on the site.

The history of the site is recorded over selected periods by inspected maps, copies of which are presented in Appendix 4. The account presented below in Table 4.1 is restricted by specific time periods represented by these maps only.

Table 4.1 Summary of historical mapping.

Dates	On Site Use	Off-Site Uses	Potential For Contamination To Affect The Site
1850	The site is not yet occupied.	The site located in a rural setting, bounded by Taylors Lane to the north. There is a row of small residential properties 15m to the west. A pond is located 15m to the east. A spring is located 90m west of the site, from which the stream flows to the west. Ainsworth Bleach Mill is located 195m south west and a smithy is located 370m south west. A small sandstone quarry is located 195m north west. A railway line runs from west to east 850m south of the site.	None anticipated.
1893-95	As above	A (water) pump is located 70m west of the site. There is a reservoir 200m north west, with a sluice at the western end. Ainsworth Bleach Mill is located 150m south west, with a reservoir 220m south west. An 'old shaft' is located 200m south east.	None additional anticipated.
1910-11	As above	There have been industrial developments along Mill Race, which flows from north to south 400m west of the site. Urban expansion has occurred in Ainsworth village, 750m to the north east. The 'old shaft' has the additional annotation 'coal'.	None additional anticipated
1930-31	The site is included in a series of allotments occupying the surrounding land. A small structure is present in the southern part of the site.	The pond is no longer shown. The site and surrounding land appears to be allotments, separated by fences, with small structures on each one. The 'old shaft' is not labelled, but there is still a feature on the map at this location. There has been some light urban development along Bury New Road, 200m to the south. Red House Pumping Station, settling beds and filter tank are located 150m south east.	Potential for localised soil contamination associated with the use of the site as allotments. Potential for landfill gas contamination from unknown materials used to infill the pond.
1937-38	No significant changes	As above.	None additional anticipated
1955-56	As above	There are four detached residences adjacent to the east, and the residences to the west appear in their present layout. The urban expansion of Bolton has reached to within 1km of the site to the west. There is no evidence of the 'old shaft'.	As above
1965-69	As above	As above	As above
1969-70	The on-site structure is no longer shown.	No significant changes noted. The allotments are no longer shown.	As above
1975	As above	The Russian military map shows no features of interest on or in the vicinity of the site.	As above
1980-87	As above	Allotments are shown 150m to the west. There is further urban expansion of Bolton to the west and Ainsworth to the east.	As above
1989	A building is shown, which matches the size and layout of the building currently present on site. A small, square structure is shown at the northern site boundary.	As above	As above

Dates	On Site Use	Off-Site Uses	Potential For Contamination To Affect The Site
1991-92	No significant changes	No significant changes	As above

In summary, the Ordnance Survey historical mapping reveals that the site is located in a rural setting at the edge of Bolton. While there are several industrial sites in the vicinity of the site, it is not anticipated that they will have adversely impacted the soil and groundwater beneath the site.

There is the potential for localised contamination from the use of the site as allotments. Heavy metals, including lead, and polycyclic aromatic hydrocarbons (PAH) are common contaminants associated with allotments.

Landfill gases are commonly associated with infilled ponds. However, as the pond was relatively small, and was dry or had been infilled by 1930, it is unlikely that this would impact the site.

5.0 GEOLOGY, HYDROGEOLOGY AND HYDROLOGY

An EnviroCheck report has been obtained for the site, a copy of which is presented in Appendix 5.

There is no made ground recorded beneath the site. The superficial deposits beneath the site are shown to comprise Devensian till of very low permeability.

The bedrock is shown to comprise the Pennine Lower Coal Measures Formation (mudstone, siltstone and sandstone) of Carboniferous age and of moderate to high permeability. A north west to south east trending fault is recorded close to the south boundary of the site.

The British Geological Survey (BGS) estimated background soil chemistry for the site, based on recorded background data. The estimated soil chemistry is presented in Table 5.0 below.

Table 5.0 BGS estimated background on site soil chemistry

Determinand	Estimated concentration (mg/kg)
Arsenic	15-25
Cadmium	<1.8
Chromium	60-90
Nickel	15-30
Lead	<150

The site is not within a Radon Affected Area, with less than 1% of properties above the action level. No Radon protection measures are reported as necessary for new properties.

The EnviroCheck mapping database shows no historic surface workings recorded within 500m of the study site.

No historical underground workings are recorded within 1000m of the study site.

The site is located in an area that may be affected by coal mining activity as defined by the Coal Authority.

The site is not shown to lie within a known non-coal historic mining area.

In relation to natural subsidence on site there is reportedly no hazard, very low or low risk of subsidence associated with shrink-swell of clays, collapsible deposits, compressible deposits, landslides, running sands or of ground dissolution of soluble rocks.

The bedrock deposits beneath the site are classified as a Secondary A aquifer, comprising predominantly permeable layers capable of supporting water supplies at a local scale, and in some cases forming an important source of base flow to rivers.

The superficial deposits on the site are classified as unproductive strata. These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

There are three groundwater abstraction licences within 1000m of the site. C.V. Home Furnishings Ltd is licensed to abstract groundwater for Textiles and Leather: Process Water from a borehole located 243m south west of the site. PCN Properties LLP is licensed to abstract groundwater for Textiles and Leather: Process Water from a borehole located 290m north west of the site. Ainsworth Finishing Company Ltd is licensed to abstract groundwater for Textiles and Leather: Process Water from a borehole located 367m north west of the site. There are a further two groundwater abstraction licences within 2000m of the site.

The site is not located within a Source Protection Zone (SPZ) for a public water supply.

There are two surface water abstraction licences within 1000m of the site. Ainsworth Finishing Company Ltd is licensed to abstract surface water for Textiles and Leather: Process Water from a reservoir fed by surface drainage at Ainsworth Mill, at two locations 248m and 300m north west of the site. There are a further five surface water abstraction licences within 2000m of the site.

The nearest surface water body, an unnamed stream, is located 94m north west of the site.

The nearest surface water quality measurement is recorded as Grade B (fair). This is for a reach of Blackshaw Brook located approximately 440m west of the site.

6.0 KEY ENVIRONMENTAL CONSIDERATIONS

The EnviroCheck report obtained for the site contains a summary of statutory data held in public registers, identifying potential sources of contamination surrounding the site, and also environmentally sensitive sites/receptors within the vicinity of the

site. A copy of the EnviroCheck report is presented in Appendix 5, and the salient information is summarised below.

Environmental Permits, Incidents and Registers

There are no IPC or IPPC authorisations within 500m of the site. There are two LAPPC authorisations for Ainsworth Finishing Co Ltd for the textile and fabric coating of finishing processes, located 219m south west of the site and for Tarmac Topmix for blending, packing, loading and use of bulk cement, located 388m west of the site.

There are no LAPPC Enforcement Notices within 1000m of the site.

There are no other environmental permits and/or authorisations within 500m of the site.

There are no COMAH or NIHHS sites within 1000m of the site, and no sites have been determined as contaminated land under the Part IIA EPA 1990 within this area.

Landfills and Other Waste Sites

There are no currently registered historical landfill sites or other waste sites within 500m of the site.

There are no Registered Waste Transfer sites within 500m of the site.

Pollution Incidents

There are two Environment Agency recorded pollution incidents to controlled waters within 500m of the site. These were minor incidents to Blackshaw Brook in 1997 (surcharged sewage) and 1993 (unknown pollutant).

Current Land Uses

There is one currently active potentially contaminative industrial site within 250 m of the site: First Choice Vehicles (used car dealer), located 246m south west of the site.

There are a further 10 currently active potentially contaminative industrial sites within 500m of the site.

There are no currently active petrol and fuel sites within 500 m of the site.

Flooding

The site is not located on an Environment Agency indicative floodplain. The site is not within 250m of any flood defences and is not an area used for flood storage.

Designated Environmentally Sensitive Sites

The site is located within an area of adopted green belt as designated by Bury Metropolitan Borough Council.

The site is not located near any other designated environmentally sensitive sites.

7.0 PRELIMINARY CONCEPTUAL SITE MODEL

7.1 Introduction

A **Site Conceptual Model** is a simplified representation of the ground conditions beneath the site that enables a quantitative risk assessment to be carried out. The Site Conceptual Model identifies the potential sources of contamination, the potential contaminant migration pathways and the potential receptors of contamination.

Sources of contamination include contaminating current or historical uses, activities, events or substances at the site or within the surrounding area that may impact on underlying soils or groundwater.

Contaminant Migration Pathways are the routes that contaminants follow from sources to receptors.

Receptors of contamination include human and non-human organisms, controlled waters (groundwater or surface water) and building materials (concrete or plastic) that experience adverse effects on exposure to contaminated materials.

A **Pollutant Linkage** occurs when a contaminant is able to travel from a source, via a pathway, to a receptor. Each element may exist in isolation and pose no environmental risk. It is only when all three elements are linked to each other that a pollutant linkage exists, and poses an environmental risk.

7.2 Potential Sources of Contamination

Potential on-site contamination sources may present risks to human health and/or controlled waters (groundwater and surface water) at the site and/or through cross boundary migration of contamination off the site.

Potential off-site contamination sources may present similar risks through cross boundary migration of contamination onto the site.

The following potentially significant sources of contamination have been identified on or in the vicinity of the site:

- Asbestos containing materials on the roof of the barn;
- Potential ground contamination from car restoration activities undertaken in the barn;
- Potential contamination by heavy metals and PAH's from the historic use of the site as allotments;
- Potential landfill gas from infilling of the former pond, located 15 m east of the site.

In addition, the sub-base beneath the building floor slab may be potentially unsuitable or undesirable for location at shallow depth beneath private garden areas, and consideration should be given to re-use as capping or sub-base beneath proposed paved areas depending on it meeting the required engineering specification.

7.3 Potential Contaminant Migration Pathways

Contaminants in the soil beneath the site caused by the former allotments or from the asbestos containing materials, or from leaks or spills associated with the activities in the garage may be contacted in future garden areas.

Such contaminated soil and associated dust may be ingested directly (accidentally or on purpose), or through soil attached to home grown vegetables. Impacted soil can also enter the body through direct skin contact. In addition, the consumption of home grown vegetables can lead to ingestion of contaminants taken up by the vegetables. Dust from contaminated soils can also be inhaled indoors and outdoors.

It is possible for contaminants to be leached from the soil and impact groundwater quality although this is considered very unlikely to present a risk to off-site receptors.

7.4 Potential Receptors of Contamination

The following potential human health and environmental receptors have been identified as:

- future site users (residents); and
- construction workers.

8.0 DISCUSSION

8.1 Potential Geotechnical Issues

The site is in an area for which a Coal Authority Mining Report is recommended. This is discussed in further detail in Section 9.

8.2 Contamination Issues

The roof of the building is very likely to be constructed from corrugated asbestos cement sheets. Prior to demolition, an asbestos survey should be undertaken by a qualified professional and any Asbestos Containing Materials (ACM) identified removed by a licensed contractor prior to demolition.

The use of the north of the building for car restoration is considered unlikely to have significantly impacted the underlying soils, as all work is undertaken on a concrete floor, and no visual indications of contamination were observed. It is understood that these activities are undertaken for personal use only and not as a commercial venture.

As the site has been historically occupied by allotment plots, it is recommended that, as a precaution, the soils beneath the proposed private gardens areas and any soft landscaped open spaces are sampled and tested to confirm suitability. This should be

extended to any topsoil and subsoils stripped from the site that are intended to be re-used within such areas.

Due to the size of the former pond, and the fact that it had dried or been infilled by 1930, it is considered very unlikely that it will have any adverse impact on the site.

The sub-base beneath existing floorslab requires inspection to assess its suitability for re-use on site.

9.0 RECOMMENDATIONS

A check on quality of topsoil and sub-soil intended for retention or re-use in proposed garden and other soft landscaped open spaces to confirm suitability.

Inspection of sub-base beneath existing floorslab for suitability for re-use beneath proposed pavement areas as capping or sub-base, subject to meeting the relevant engineering specification.

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While not strictly an issue relating to potential contamination, it is advisable to obtain a Coal Authority report to confirm if there is any likely risk to the property from old mineshafts or potential shallow workings that may require consideration. The site is located in an area that could potentially be at risk, and subsidence can occur unexpectedly, particularly if there are changes to a site that may trigger collapse of meta-stable fill, e.g. vibration from building work, drainage into the ground from leaking pipes.

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APPENDIX 1

Site Location Plan

10k Raster Mapping

Published 2012

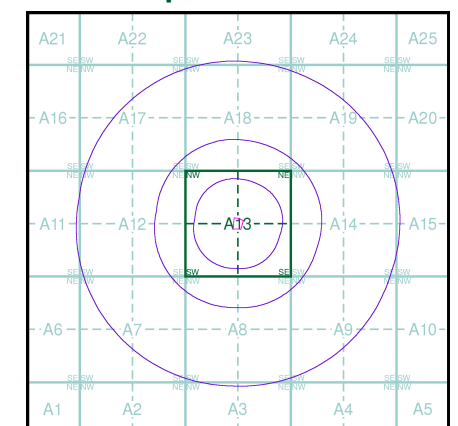
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey's 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)

SD71SW	SD71SE
2012	2012
1:10,000	1:10,000
SD70NW	SD70NE
2012	2012
1:10,000	1:10,000

Historical Map - Slice A

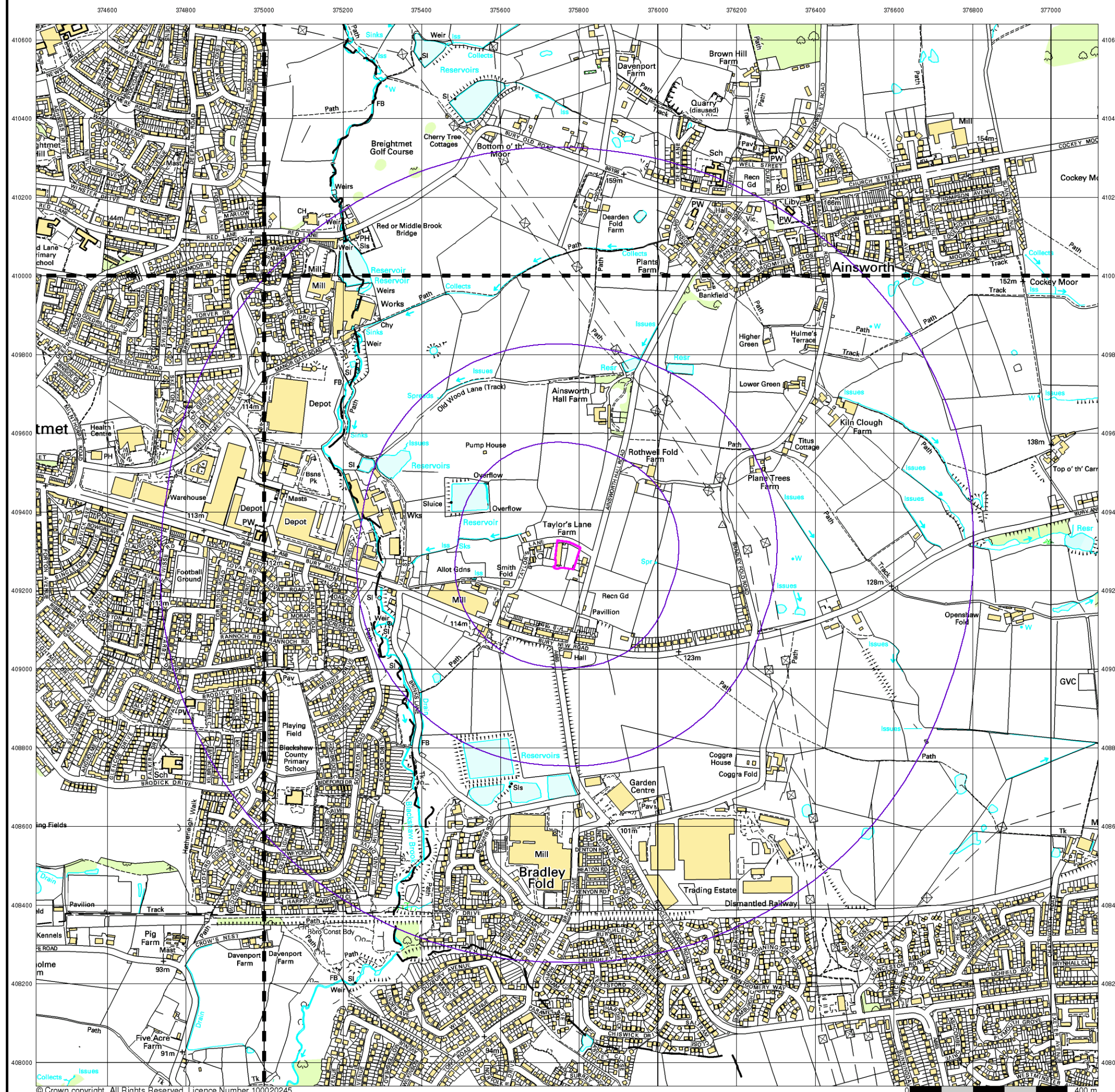


Order Details

Order Number: 44259587_1_1
 Customer Ref: 13/659
 National Grid Reference: 375770, 409290
 Slice: A
 Site Area (Ha): 0.37
 Search Buffer (m): 1000

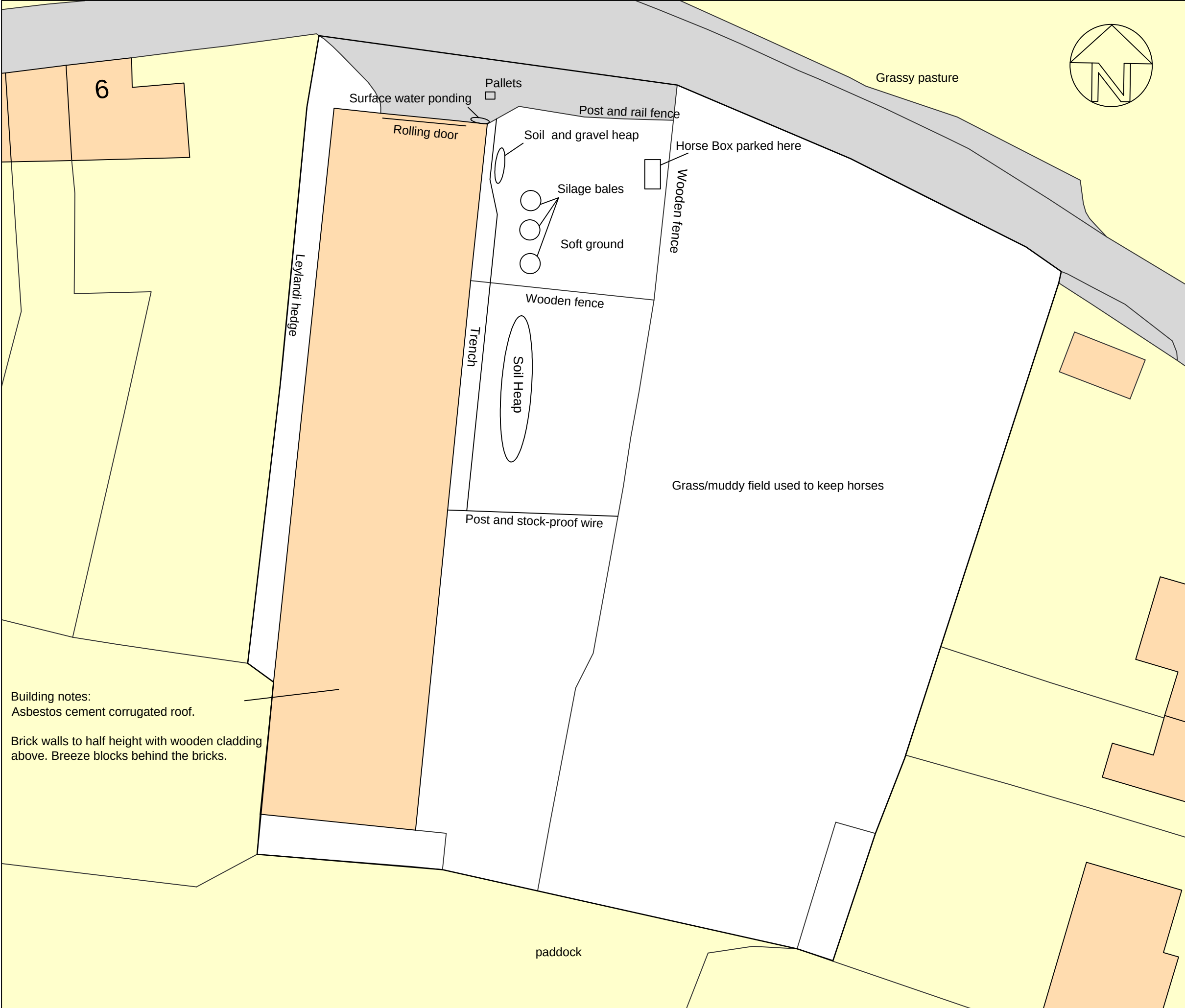
Site Details

9 Taylors Lane, BOLTON, BL2 6QS



APPENDIX 2

Key Site Features



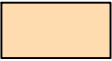
Building notes:
Asbestos cement corrugated roof.

Brick walls to half height with wooden cladding above. Breeze blocks behind the bricks.

NOTES

- 1. DO NOT SCALE.
- 2. This drawing is to be read in conjunction with all other relevant drawings.
- 3. All boundaries are approximate.

KEY

-  Building area
-  Unsurfaced track

DESCRIPTION	REV	DATE	CHKD	APPR



PEAK ASSOCIATES
ENVIRONMENTAL CONSULTANTS LTD

CLIENT
E. Haslam

PLAN NO.

PLAN TITLE
Key Site Features

DRAWN	MG	PROJECT ENGINEER	JM
CHECKED	JM	APPROVED	JM
DATE	18/02/2013	SCALE	1:300 @ A3
DRAWING NUMBER	549001	REVISION	-

APPENDIX 3

Site Photographs



Photo 1: The Northern end of the barn, with the pallets and standing water in the foreground.



Photo 2: View from the southern boundary up towards the horse box.



Photo 3: Wooden pallets and standing surface water in front of the entrance to the barn.



Photo 4: Stockpile of soil at the eastern edge of the barn.



Photo 5: View looking east from the site entrance.



Photo 6: View towards neighbouring residences across the paddock.