

4.0 PRELIMINARY CONTAMINATION ASSESSMENT

Based on the findings of the Phase I Site Appraisal, the risk of ground contamination is generally considered to be very low to negligible. Accordingly, due to the presence of localised sources of contamination including, the previous/existing land use and on and off-site development, contamination testing carried out as part of a future Phase II Ground Investigation will be required to investigate the site and assess these potential sources.

At this stage, and based on the available Desk Study information, it is considered that an allowance is made for the following forms of mitigation:

- Further assessment of the shallow soils due to the potential for naturally occurring elevated arsenic concentrations.
- Localised excavation and disposal of contaminated soils, or the placement of a clean capping layer in residential gardens and soft landscaped areas.

5.0 PRELIMINARY GEOTECHNICAL ASSESSMENT

The following comments and recommendations are based on the findings of this desk study, which may not give a true indication of a soil's actual engineering properties (i.e., stability, mass, structure etc). Before any development, a ground investigation is recommended to confirm the initial recommendations outlined below, the scope of which is outlined in Section 6.

However, at this stage based on the desk-based information available it is considered:

- The ground conditions are likely to comprise variable weathered strata (clay/clayey sand) over solid strata associated with Whitby Mudstone Formation – mudstone and the Marlstone Rock Formation - Ferruginous Limestone and Ironstone. The Marlstone Rock Formation is known to produce soils with elevated concentrations of arsenic, which will require assessment.
- Providing deep Made Ground, soft and/or very loose materials are not present, the site is likely to be suitable for the use of traditional trench, strip, or pad foundations.
- Due to the presence of mixed strata, including potential shrinkable soils and the presence of trees, deepening of foundations following NHBC standards may be required locally.
- Outside any areas of unsuitable strata (Made Ground and/or soft or loose materials), the site may be suitable for the use of ground-bearing slabs; however, at this stage allowance should be made for the use of suspended floors. Beam and block floors may be required in the zone of influence of trees.
- KAB Ltd has reviewed third-party soakaway test results for the adjacent development, which suggest that for the majority of the site the adoption of a soakaway drainage system is considered unlikely. However, soakaway testing would be required to confirm this assessment.

6.0 FURTHER INVESTIGATION

A Phase II ground investigation is recommended to determine more accurately the effect of the identified hazards on the development. Potential site works could include:

- A ground investigation designed to BS10175:2017 and BS5930:2015, comprising a window sampling and trial pitting, to confirm ground conditions, obtain in-situ geotechnical information and collect samples for laboratory testing. The trial pitting would also allow infiltration testing to be carried out and provide data for the design of the site drainage.
- Chemical analysis of soils followed by a risk assessment, to provide an assessment of the risk to human health and controlled waters, including targeted arsenic bioaccessibility testing.
- Based on the Phase I Conceptual Model (Section 3) as the receptor risk is high (residential) and the gas source production risk is very low (localised Made Ground and localised areas of infilled ground - pond), the ground gas risk has been assessed as very low. A precautionary ground gas investigation designed to current guidance will determine the ground gas regime beneath the site and satisfy the Local Authority.
 - A gas monitoring programme would quantify the risk to the end users and allow any necessary mitigation measures to be recommended. At this stage, an allowance for 6 visits over 2/3 months is considered suitable to assess potential liabilities. However, as there are no significant sources of ground gases and the plots will be installed with full radon protection measures, if no elevated gases are reported during the initial visits, it may be possible to reduce this to three visits over six weeks (subject to agreement with the Local Authority).
- Geotechnical soil testing of the strata to assess its character, determine appropriate founding depths and specify suitable grades of buried concrete.

Following your review of this document, a copy of it should be submitted to the Planning Department of the Local Authority for comment and approval before any ground investigation works are undertaken, as this is often a condition of planning.

7.0 CONCLUSIONS

Based on the information reviewed as part of the desk study (Section 2), and the resultant Initial Conceptual Model (Section 3), no significant constraints have been identified that would affect the development of the site. This Phase I Site Appraisal has therefore shown that the site is suitable for the proposed development, assuming compliance with all the recommendations contained within this report.

It is recommended a copy of this report should be submitted to the Local Authority in support of the planning application.

8.0 GENERAL INFORMATION SOURCES

For planning purposes, the National Planning Policy Framework (NPPF) requires that the assessment of risks arising from contamination and remediation requirements should be considered on the basis of the current environmental setting, the current land use, and the circumstances of its proposed new use. In most other respects, however, the underlying approach to identifying and dealing with risk, and the overall policy objective of safeguarding human health and the environment, are similar to that outlined in Part 2A.

8.1 Information

Various standard sources of information have been used for the identification and assessment of potential ground hazards and include the following (where available):

- BRE – Radon, Guidance on protective measures for new buildings (BR211, 2015)
- HPA-RPD-033 (2007), ‘Indicative Atlas of Radon in England and Wales’
- PHE-CRCE-032 (PHE, 2017), Radon in Homes in England: 2016 Data Report
- British Geological Survey Sheet, Solid and Drift Edition. Scale 1:50 000
- British Geological Survey Sheet, Solid and Drift Edition. Scale 1:10 000
- British Geological Survey Memoir
- British Geological Survey Borehole Records:
BGS online viewer: <http://www.bgs.ac.uk/data/mapViewers/home.html>
- BS8485:2015, ‘Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings’
- CIRIA C552 2001 Contaminated Land Risk Assessment. A Guide to Good Practice
- CIRIA C665 ‘Assessing risks posed by hazardous ground gases to buildings’
- Coal Authority Records / Coal Mining Report
- DEFRA/Environment Agency Contaminated Land publications and DoE Industry Profiles
- Environment Agency Groundwater Vulnerability Maps
- Environment Agency Website: <http://www.environment-agency.gov.uk/>
- Environmental Data Report (e.g., Groundsure Report/Envirocheck Report) including geological data, regulatory searches, and OS historical maps
- Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites, UKWIR, 2010
- Relevant British Standards

APPENDIX A

SURVEY NOTES

1. THE SURVEY GRID (OSGB36) WAS ESTABLISHED WITH GPS AND THEN A ONE POINT SITE CENTRED TRANSFORMATION CARRIED OUT TO ELIMINATE SCALE FACTOR. IN ORDER TO RE-ESTABLISH THE SITE GRID THEN THE EXISTING SURVEY CONTROL STATIONS SHOWN MUST BE USED.
 2. SURVEY LEVELS ESTABLISHED BY GPS TO DS DATUM

SURVEY KEY

House	Building	Survey Control Station
Wall	Retaining Wall	Hedge
R/Wall	Verge/Edge of Track etc	Kerline
P/W	Fence (with description)	Overhead Line
Chestnut Paving	C/P	Footpath
Close Boarded	C/B	Seer Line
Corrugated Iron	C/I	Water/Ditch etc
Chain Link	C/L	Gate
Crash Barrier	CBR	Stile
Concrete Panel	Con/P	Individual Tree
Ht and Miss	H/M	U/R
Interwoven	Int	F/esc
Post & Wire	P/W	DK
Post & Rail	P/R	Stone
Post & Chain	P/C	Gravel Surface
Overlap	O/L	Concrete Surface
Iron Railings	I/R	Tarmac
Post & Barbed Wire	P/BW	Rough Ground
Electric	Ele	Grass/Leam
Hoarding	Hrd	Gross
Post & Wire Mesh	P/W/M	Paving
Picket (Wooden)	P/WK	Tactile Paving
Trip Rail	T/R	Unable To Raise
Trellis Fence	T/F	Fire Escape
Palisade Fence	P/F	Drop Kerb
Floor Level	FL	Stone Surface
Eaves Level	EL	Gravel Surface
Ridge Level	RL	Concrete Surface
Tarmac Surface	Tarmac	Rough Ground
Grass/Leam	Grass	Grass Sets/Cobbles
Paving Slabs	Paving	Cobbles
Tactile Paving	Tactile Paving	T/Fov

STREET FURNITURE

Bellina Beacon	BB O	Marker Post	Mir +
Borehole	BO O	Mile Post	MP O
Bollard	BL O	Pillar Box	PB O
Bus Stop	BS O	Pipe	PI +
Drain	Dr O	Parking Meter	PM O
Electric Pole	EP O	Post	PO O
Flood Light	FL O	Rodding Eye	RE O
Flagstaff	FS O	Reflector Post	RP O
Gate Post	GP O	Road Sign	RS O
Gully	GU O	Stop Cock	SC O
Gas Valve	GV O	Stop Tap	ST O
Inspection Cover	IC O	Sign	SI O
Litter Bin	LB O	Stump	ST O
Lump Post	LP O	Stop Valve	SV O
Traffic Light	TL O	Telegraph Pole	TP O
Manhole	MH O	Vent Pipe	VP O
Name Plate	NP	Telecommunication	TC O
Fire Hydrant	FH O	Water Tap	WT O
Wash Out	WO O	Kerb Ductlet	KD O
Water Meter	WM O	Air Valve	AV O
Cable Television	TV O	Tel Call Box	TCB O
Earth Rod	ER O	Trail Pit	T/PB O
Speed Camera	SC O	Closed Circuit TV	CT O
Cellar Light	Ca/L	Multi Utility Pole (E/P, A/P, T/P)	MUP O

TECHNICAL NOTES

INFORMATION SHOWN ON THIS DRAWING IS SURVEYED TO THE ACCURACY OF THE BASE SCALE SHOWN IN THE LEGEND.

MAN ENTRY TO SEWERS HAS NOT BEEN UNDERTAKEN. DEPTHS, PIPE SIZES ARE MEASURED/ESTIMATED FROM THE GROUND. ALL SEWER DETAILS TO BE CHECKED WITH LOCAL AUTHORITY RECORDS OR ON SITE PRIOR TO COMMENCEMENT OF WORKS.

BOUNDARIES SHOWN ARE PHYSICAL FEATURES AND MAY NOT REPRESENT LEGALLY CONVEYED OWNERSHIP.

ALL TREE HEIGHTS AND SPREADS ARE APPROXIMATE. TREE TYPES WHICH HAVE BEEN IDENTIFIED SHOULD BE CHECKED BY A TREE SPECIALIST.

WHERE ADJACENT BUILDINGS HAVE BEEN SURVEYED REMOTELY NOT ALL EXTERNAL WALLS MAYBE SHOWN DUE TO OBSTRUCTIONS ALONG LINE OF SIGHT.

REV	DATE	DESCRIPTION	BY	APP.

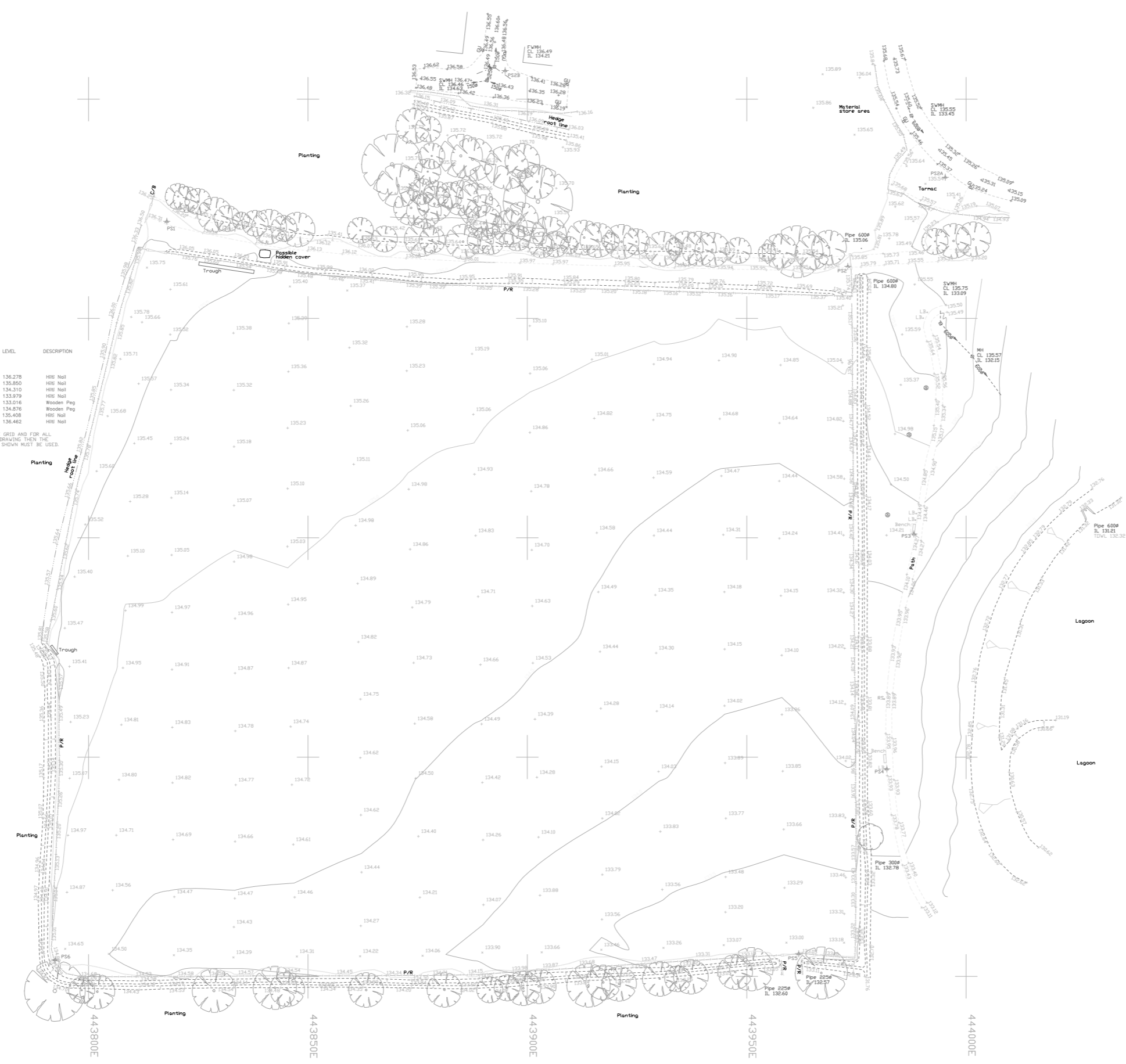
Phoenix Survey Services Ltd.
 49 William Road, Long Buckby, Northampton NN6 7YD
 Tel 07876 656389 or 07810 752133
 Email info@phoenixsurvey.co.uk

Barwood

Client: **Bloxham Road Banbury**

Project Title: **Topographical Survey Sheet 1 of 1**

Drawn	ALB	Checked	GRA	Approved	GRA
Date	25/10/2022	Scale	1/500	Sheet Size	A1
Dwg. No.	S5027/01			Rev	





STATION	EASTINGS	NORTHINGS	LEVEL	DESCRIPTION
PS1	443817.818	238772.140	136.278	H/W Nail
PS2	443973.040	238761.871	135.800	H/W Nail
PS3	443988.080	238700.879	134.310	H/W Nail
PS4	443981.904	238647.306	133.979	H/W Nail
PS5	443961.822	238601.171	133.016	Wooden Peg
PS6	443792.398	238603.834	134.876	Wooden Peg
PS2A	443995.230	238782.210	135.408	H/W Nail
PS2B	443894.935	238800.805	136.462	H/W Nail

IN ORDER TO RE-ESTABLISH THE SITE GRID AND FOR ALL SETTING OUT WORKS BASED ON THIS DRAWING THEN THE EXISTING SURVEY CONTROL STATIONS SHOWN MUST BE USED.

DO NOT SCALE



NOTES:

-  Approx. Site Location
-  Approx. Site Boundary



kevin@kabgeo.com/kevinbullock1962@gmail.com

CLIENT:
Barwood Development Securities Ltd

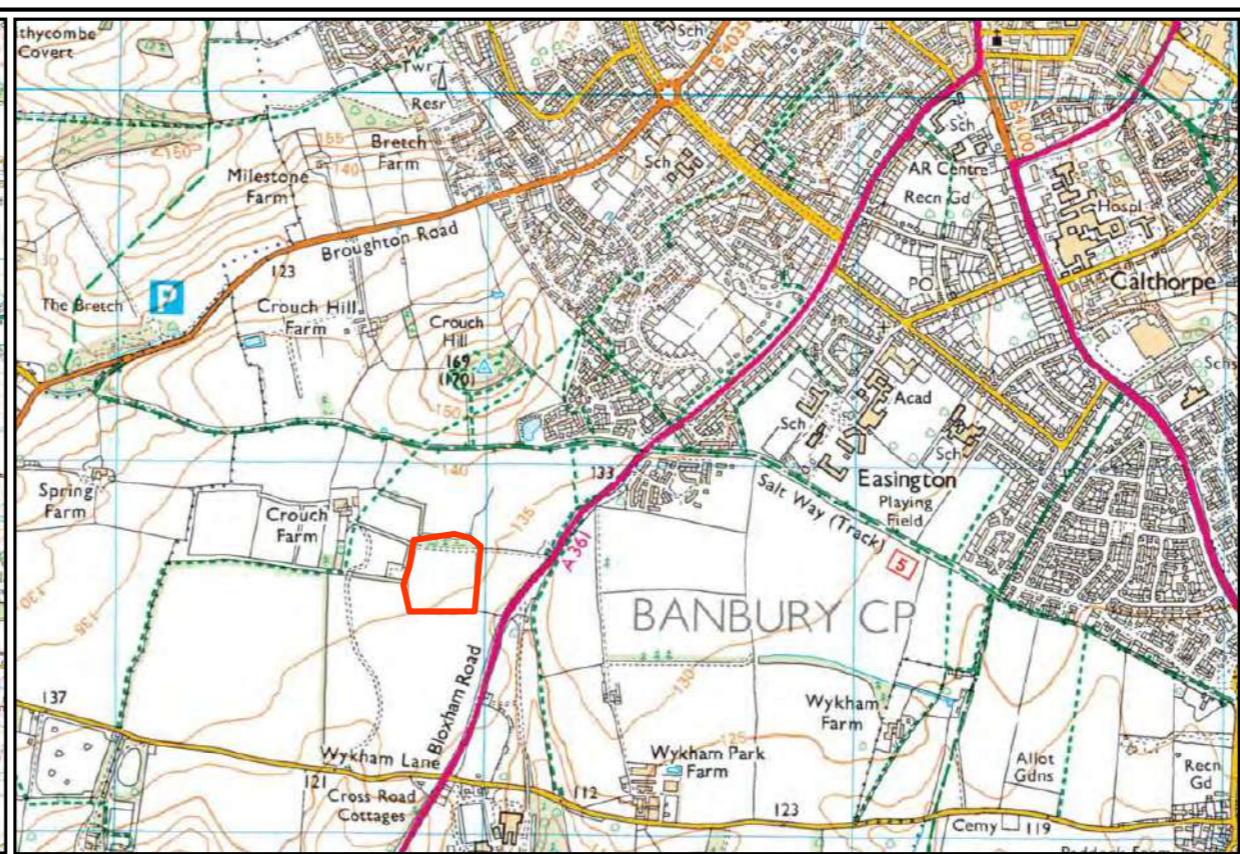
PROJECT:
Land West of Bloxham Road,
Banbury, Oxfordshire

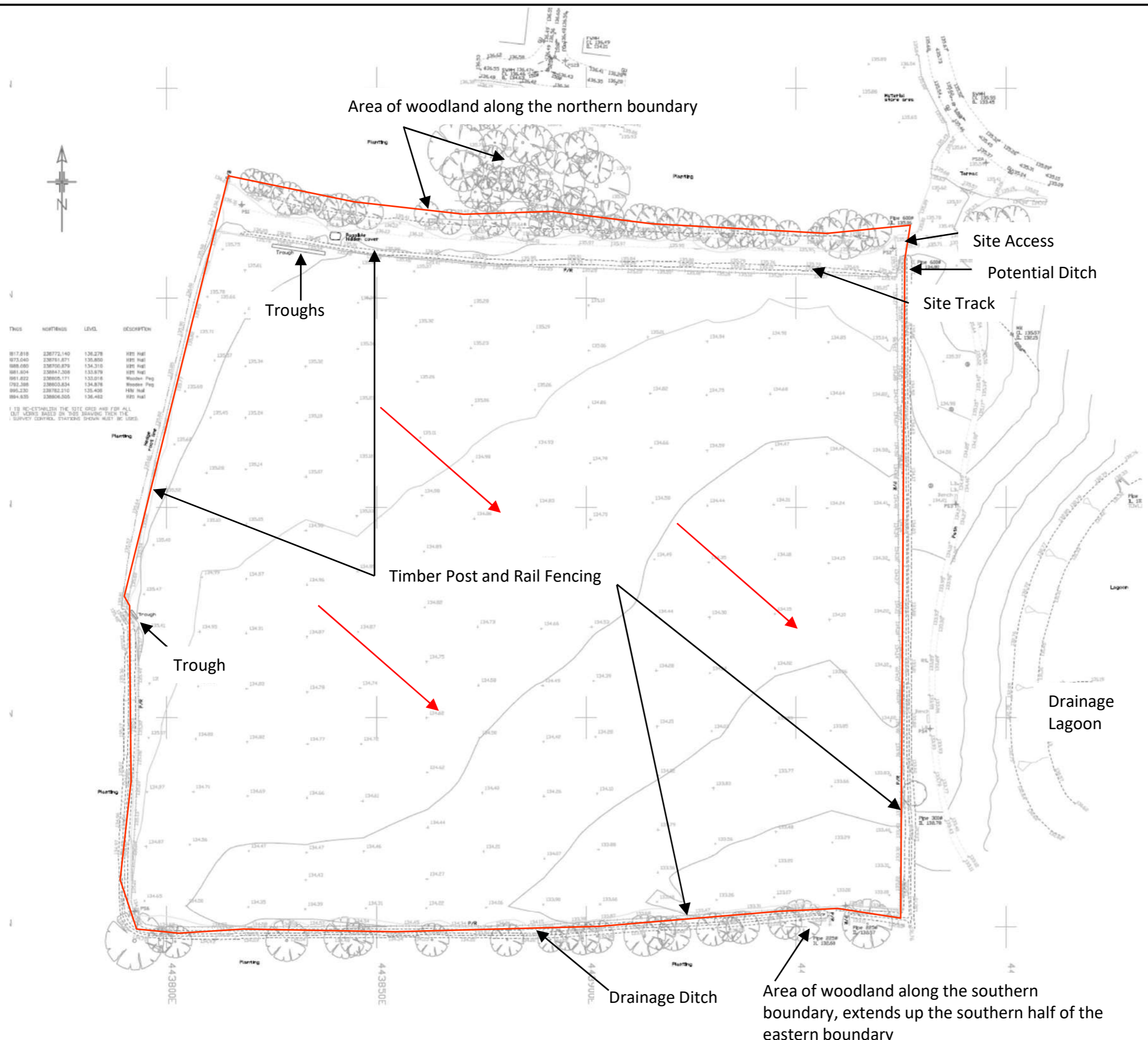
TITLE:
Site Location Plan

SCALE@SIZE : NTS ISSUE: Final

DESIGN/DRAWN : KAB DATE: October 2022

PROJECT No: 22021 DRAWING No: 001







DO NOT SCALE



NOTES:

 Approx. site boundary

 The Site gently slopes down to the south east.



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CLIENT:
Barwood Development Securities Ltd

PROJECT:
Land West of Bloxham Road,
Banbury, Oxfordshire

TITLE:
Site Observations

SCALE@SIZE :
NTS

ISSUE:
Final

DESIGN/DRAWN :
KAB

DATE:
October 2022

PROJECT No:
22021

DRAWING No:
002



Aerial view of the site, towards the western field boundary. Shows the metal agricultural building adjacent to the boundary.



Aerial view of the site, towards the northern field boundary. Shows the farm track, the woodland and the new development beyond.

DO NOT SCALE

NOTES:



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CLIENT:

Barwood Development Securities Ltd

PROJECT:

Land West of Bloxham Road,
Banbury, Oxfordshire

TITLE:

General Site Walkover Photographs

SCALE@SIZE :
NTS

ISSUE:
Final

DESIGN/DRAWN :
KAB

DATE:
October 2022

PROJECT No:
22021

DRAWING No:
003A

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Aerial view of the site, towards the north eastern corner of the site. Shows the track, woodland and the adjacent development.



Aerial view of the site, towards the eastern field boundary. Shows the drainage lagoon beyond the timber fence boundary.

DO NOT SCALE

NOTES:



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CLIENT:

Barwood Development Securities Ltd

PROJECT:

Land West of Bloxham Road,
Banbury, Oxfordshire

TITLE:

General Site Walkover Photographs

SCALE@SIZE :
NTS

ISSUE:
Final

DESIGN/DRAWN :
KAB

DATE:
October 2022

PROJECT No:
22021

DRAWING No:
003B

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DO NOT SCALE

NOTES:



View from the western end of the track, looking to the east and towards the access gate to the south of Crouch Cottages, Bloxham Road.



View from the access gate at the eastern end of the track, looking to the west and towards one of the access gates to Crouch Farm.



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CLIENT:

Barwood Development Securities Ltd

PROJECT:

Land West of Bloxham Road,
Banbury, Oxfordshire

TITLE:

General Site Walkover Photographs

SCALE@SIZE :
NTS

ISSUE:
Final

DESIGN/DRAWN :
KAB

DATE:
October 2022

PROJECT No:
22021

DRAWING No:
003C



View through the access gate towards the ditches along the eastern boundary – the ditch was dry and may have been culverted or diverted.



View from the access gate at the eastern end of the track, looking to the south, along the eastern site boundary.



View from the north western corner of the field and towards the north east, shows the animal troughs, the track and woodland to the rear.



View from the north western corner of the field, towards the south eastern corner. Shows the wooden rail fencing and the wooded area beyond.



View from the south western corner, along the southern boundary. Shows the wood rail fencing and the trees along the boundary.



View through the southern boundary, shows an overgrown ditch in the foreground, beyond which are the trees, a second wooden fence and another farm road.

DO NOT SCALE

NOTES:



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CLIENT:
Barwood Development Securities Ltd

PROJECT:
Land West of Bloxham Road,
Banbury, Oxfordshire

TITLE:
General Site Walkover Photographs

SCALE@SIZE : NTS	ISSUE: Final
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DESIGN/DRAWN : KAB	DATE: October 2022
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PROJECT No: 22021	DRAWING No: 003D
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APPENDIX B

Geology 1:50,000 Maps Legends

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	ALV	Alluvium	Clay, Silt, Sand and Gravel	Not Supplied - Holocene
	HEAD	Head	Clay, Silt, Sand and Gravel	Not Supplied - Quaternary

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	CNL	Chipping Norton Limestone Formation	Limestone, Ooidal	Not Supplied - Bathonian
	HYSA	Horsehay Sand Formation	Sandstone	Not Supplied - Bajocian
	NS	Northampton Sand Formation	Sandstone, Limestone and Ironstone	Not Supplied - Aalenian
	WHM	Whitby Mudstone Formation	Mudstone	Not Supplied - Toarcian
	MRB	Marlstone Rock Formation	Ferruginous Limestone and Ironstone	Not Supplied - Pliensbachian
	DYS	Dyrham Formation	Siltstone and Mudstone, Interbedded	Not Supplied - Pliensbachian
	CHAM	Charmouth Mudstone Formation	Mudstone	Not Supplied - Sinemurian
		Faults		

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Geology 1:50,000 Maps

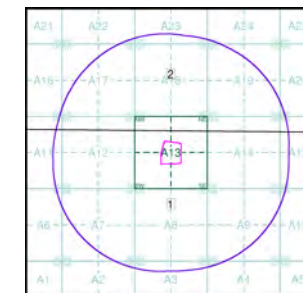
This report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:50,000 scale and is designed for users carrying out preliminary site assessments who require geological maps for the area around the site. This mapping may be more up to date than previously published paper maps.

The various geological layers - artificial and landslip deposits, superficial geology and solid (bedrock) geology are displayed in separate maps, but superimposed on the final 'Combined Surface Geology' map. All map legends feature on this page. Not all layers have complete nationwide coverage, so availability of data for relevant map sheets is indicated below.

Geology 1:50,000 Maps Coverage

Map ID:	1	Map ID:	2
Map Sheet No:	218	Map Sheet No:	201
Map Name:	Chipping Norton	Map Name:	Banbury
Map Date:	1968	Map Date:	1982
Bedrock Geology:	Available	Bedrock Geology:	Available
Superficial Geology:	Available	Superficial Geology:	Available
Artificial Geology:	Available	Artificial Geology:	Available
Faults:	Not Supplied	Faults:	Not Supplied
Landslip:	Available	Landslip:	Available
Rock Segments:	Not Supplied	Rock Segments:	Not Supplied

Geology 1:50,000 Maps - Slice A



Order Details:

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Customer Reference:	22021
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Search Buffer (m):	1000

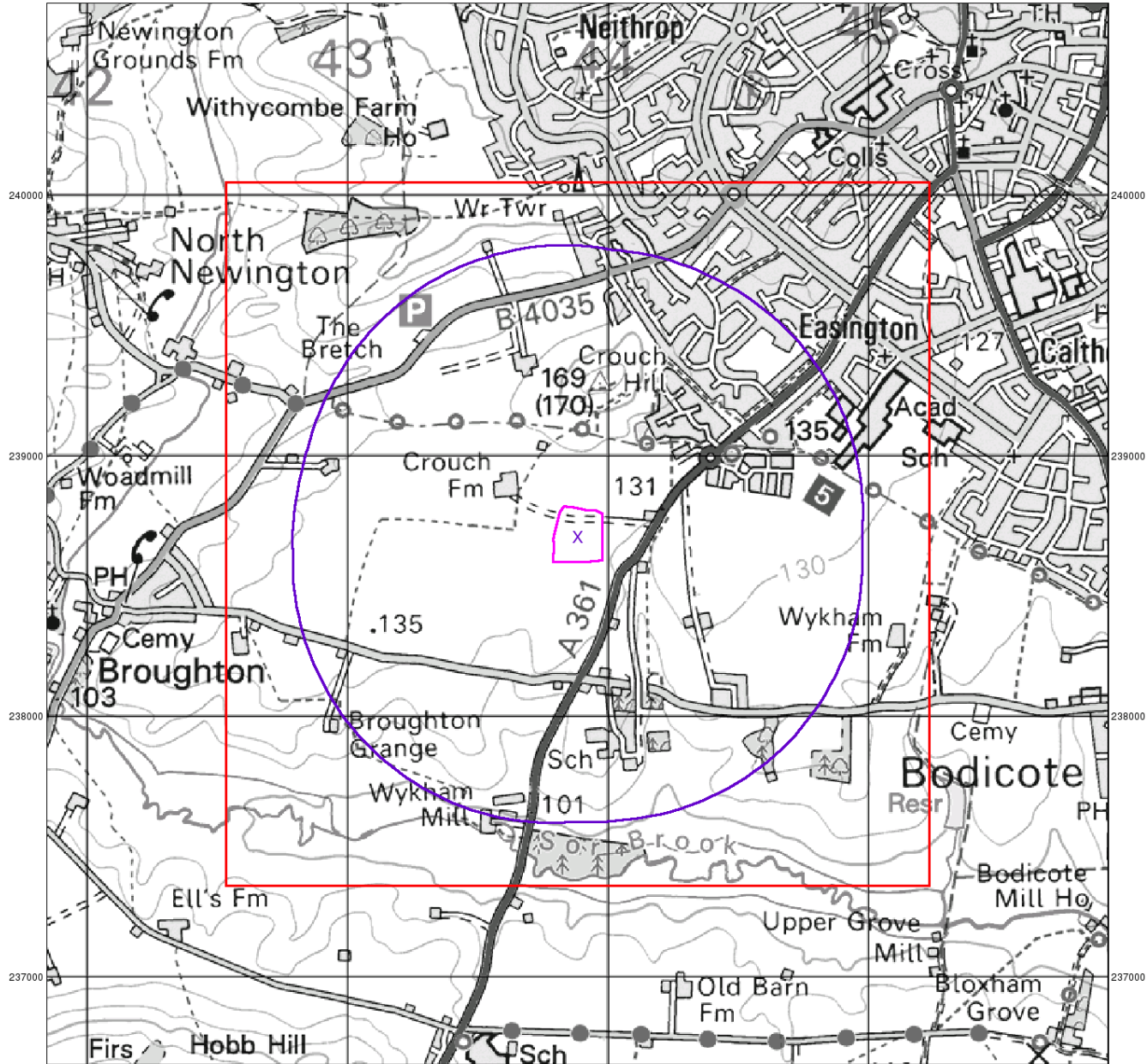
Site Details:

Crouch Farm, Bloxham Road, BANBURY, OX16 9UN

Landmark
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Tel: 0844 844 9952
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Artificial Ground and Landslip

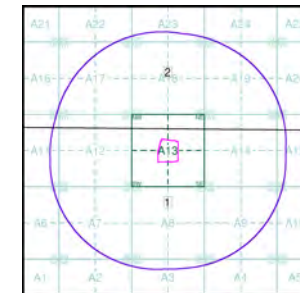
Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions and unstable ground.

Artificial ground includes:

- Made ground - man-made deposits such as embankments and spoil heaps on the natural ground surface.
- Worked ground - areas where the ground has been cut away such as quarries and road cuttings.
- Infilled ground - areas where the ground has been cut away then wholly or partially backfilled.
- Landscaped ground - areas where the surface has been reshaped.
- Disturbed ground - areas of ill-defined shallow or near surface mineral workings where it is impracticable to map made and worked ground separately.

Mass movement (landslip) deposits on BGS geological maps are primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground. The dataset also includes foundered strata, where the ground has collapsed due to subsidence.

Artificial Ground and Landslip Map - Slice A



Order Details:

Order Number: 302599622_1_1
 Customer Reference: 22021
 National Grid Reference: 443880, 238690
 Slice: A
 Site Area (Ha): 3.6
 Search Buffer (m): 1000

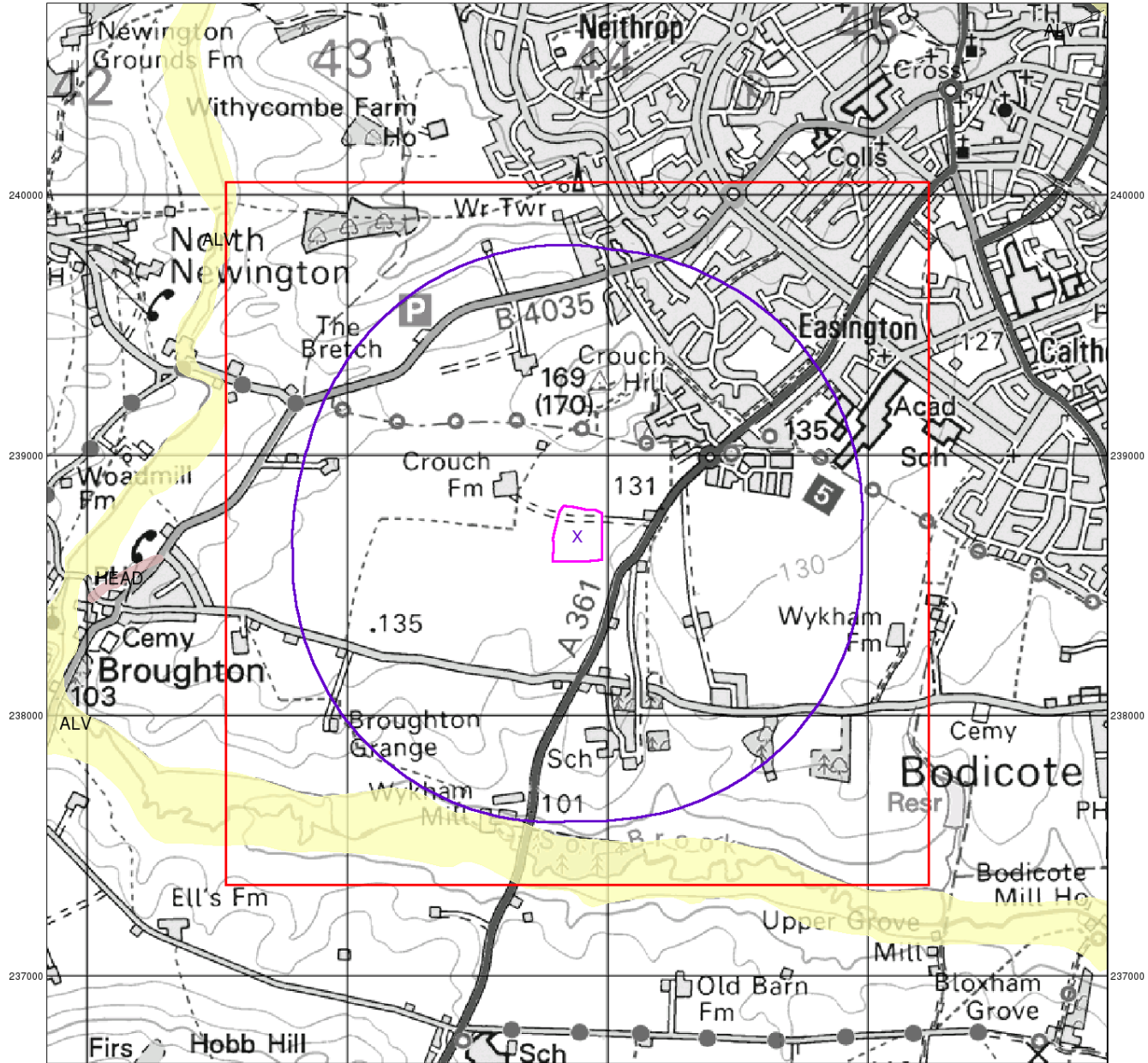
Site Details:

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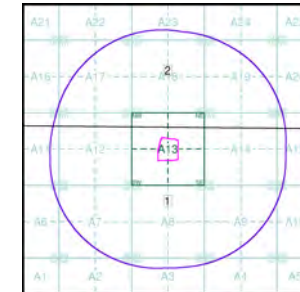
Superficial Geology

Superficial Deposits are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back about 1.8 million years from the present.

They rest on older deposits or rocks referred to as Bedrock. This dataset contains Superficial deposits that are of natural origin and 'in place'. Other superficial strata may be held in the Mass Movement dataset where they have been moved, or in the Artificial Ground dataset where they are of man-made origin.

Most of these Superficial deposits are unconsolidated sediments such as gravel, sand, silt and clay, and onshore they form relatively thin, often discontinuous patches or larger spreads.

Superficial Geology Map - Slice A



Order Details:

Order Number: 302599622_1_1
 Customer Reference: 22021
 National Grid Reference: 443880, 238690
 Slice: A
 Site Area (Ha): 3.6
 Search Buffer (m): 1000

Site Details:

Crouch Farm, Bloxham Road, BANBURY, OX16 9UN

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