



FLOOD RISK ASSESSMENT

**Change of Land and Equestrian Barn
@ 22 Acre Paddock, Mentmore, LU7 0QG
for Elizabeth Hough**

JUNE 2022



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1.0 Introduction

- 1.1.1 This Flood Risk Assessment (“FRA”) has been produced in relation to the land known as 22 Acre Paddock in Mentmore LU7 0DQ which comprises grassland paddocks.
- 1.1.2 This FRA has been produced as a supporting document for a planning application for the change of use of land to mixed agricultural and equestrian use, along with the construction of a barn of four stables, tack room, rug room, feed store and bedding store. The Barn will have a gross external area of 217sqm.
- 1.1.3 A Site Location Plan is provided in Appendix 1. This report considers the flood risk of the proposed change of use of the land, siting of equestrian barn and the impact that the proposals will have in relation to flooding of adjacent areas and watercourses. It also considers any limits relating to flooding that are likely to be imposed to allow the proposals to be approved.
- 1.1.4 This report takes into account any relevant requirements of National Planning Policy Framework (“NPPF”) and is based on information received from the Environment Agency (“EA”) web site.
- 1.1.5 This report is for the private and confidential use of the Client and its agents and may not be copied in whole or in part without the written permission of Briggs & Stone Limited.

2.0 Existing Site

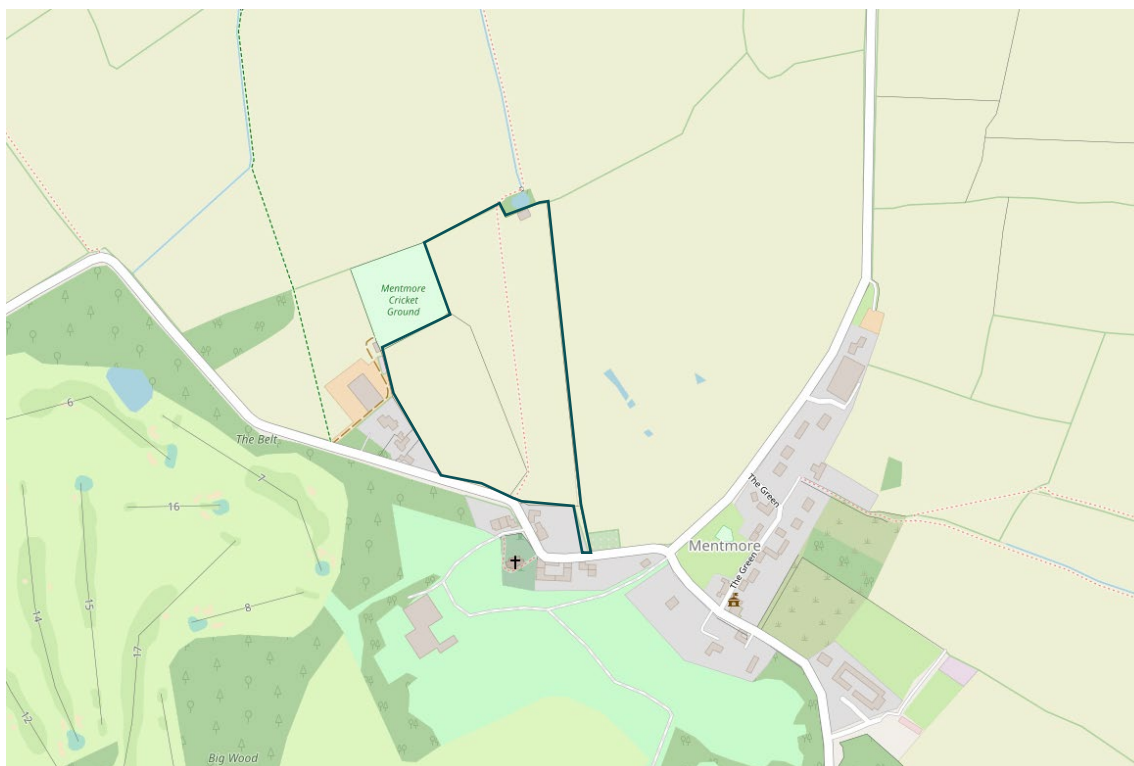


Figure 1: Location Plan © OpenStreetMap & Contributors



- 2.1.1 The Application Site comprises permanent pasture. The land is accessed off Cheddington Road. The site is centred on grid reference SP894194 and is approximately 8.9 hectares in size.
- 2.1.2 The proposal is for the change of use of the whole Application Site from agricultural to mixed agricultural and equestrian use to enable the keeping of horses on the land. The proposal also includes the development of a barn with a foot print of 217sqm to provide stables and ancillary storage.
- 2.1.3 The Application Site is shown on the EA mapping system as being in a Flood Zone 1 i.e. in an area that has a low probability of flooding from rivers and the sea.
- 2.1.4 The site is classed as Less Vulnerable under the NPPF Annex 3: Flood Risk Vulnerability Classification. As such, the existing and proposed use of the site is deemed to be an appropriate development for Flood Zone 1 and under the NPPF Annex 3: Flood Risk Vulnerability and Flood Zone 'Compatibility'. Notwithstanding this the Application Site extends to more than 1 hectare and hence this FRA has been produced to accompany the Planning Application.
- 2.1.5 The Application Site is a greenfield site. The eastern and northern boundaries abut arable fields. The south and south west boundaries are largely abounded by the Cheddington Road and a scattering of residential dwellings.
- 2.1.6 There are three accesses to the Application Site, two are directly from the Cheddington Road and one is via third party owned land. Cheddington Road is a C-Road which is maintainable at public expense. There are no formal rights of access via the latter gateway. The primary access is the eastern most.

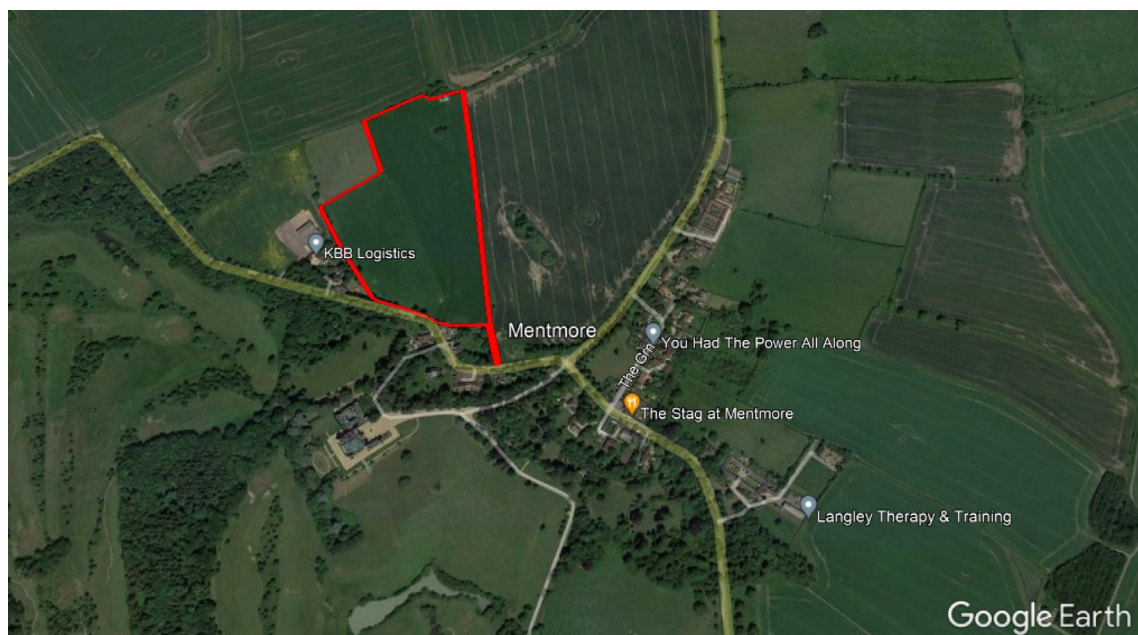


Figure 2: 22 Acre Paddock within the context of the wider landscape



- 2.1.7 The nearest significant watercourse to the site is the Grand Union Canal which is approximately 2.44km away.
- 2.1.8 No surface water drainage is present on site. All runoff is currently discharged to ground.
- 2.1.9 British Geological Survey (“BGS”) maps indicate the site to be underlain by Gault formation (see Appendix 2).
- 2.1.10 There are four historic logs of a borehole located to the east of the Application Site which confirms the ground conditions – see Figure 4 for their locations and Appendices 3-6 for the logs of
- SP92SW260 — Mentmore Buckinghamshire 1 (490180, 220010) Depth: 8.5m.
 - SP91NW26 — Mentmore Buckinghamshire 2 (490440, 219870) Depth: 8.5m.
 - SP91NW24 – Mentmore Mansion (490260, 219720) Depth 200ft
 - SP91NW27 - Mentmore Buckinghamshire 3 (490650,219770) Depth: 4.5m

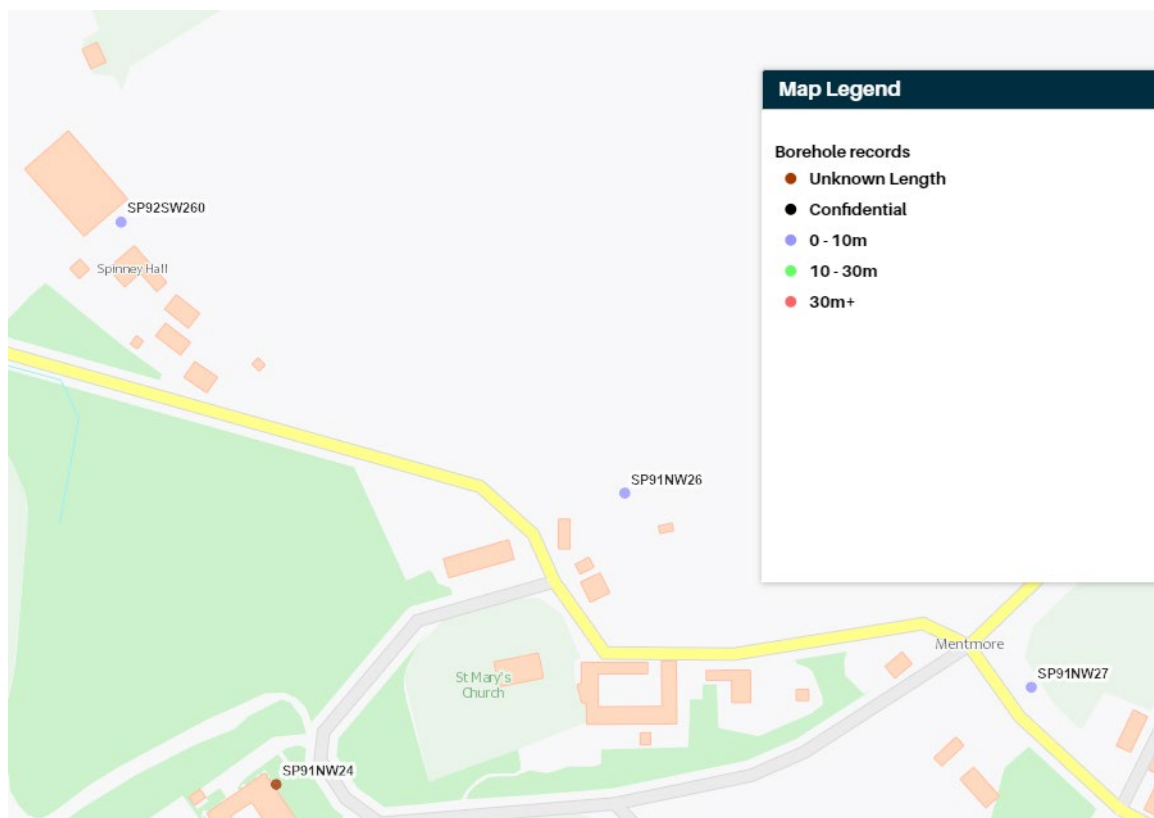


Figure 3: Location of Historic Boreholes near Application Site

3.0 Potential Flood Risks

- 3.1.1 Flood plain mapping provided by the EA indicates that the site lies in Flood Zone 1.



3.1.2 Flood Zone 1 is defined as comprising “land assessed as having less than 1 in 1000 annual probability of river flooding (0.1%)”.

3.1.3 On this basis the site is considered to have a low risk of flooding and therefore does not have to pass the Sequential or Exception Tests. See extract of Flood Map below:

Your development is in flood zone 1. This means it has a low probability of flooding from rivers and the sea.

[More information about your results](#)

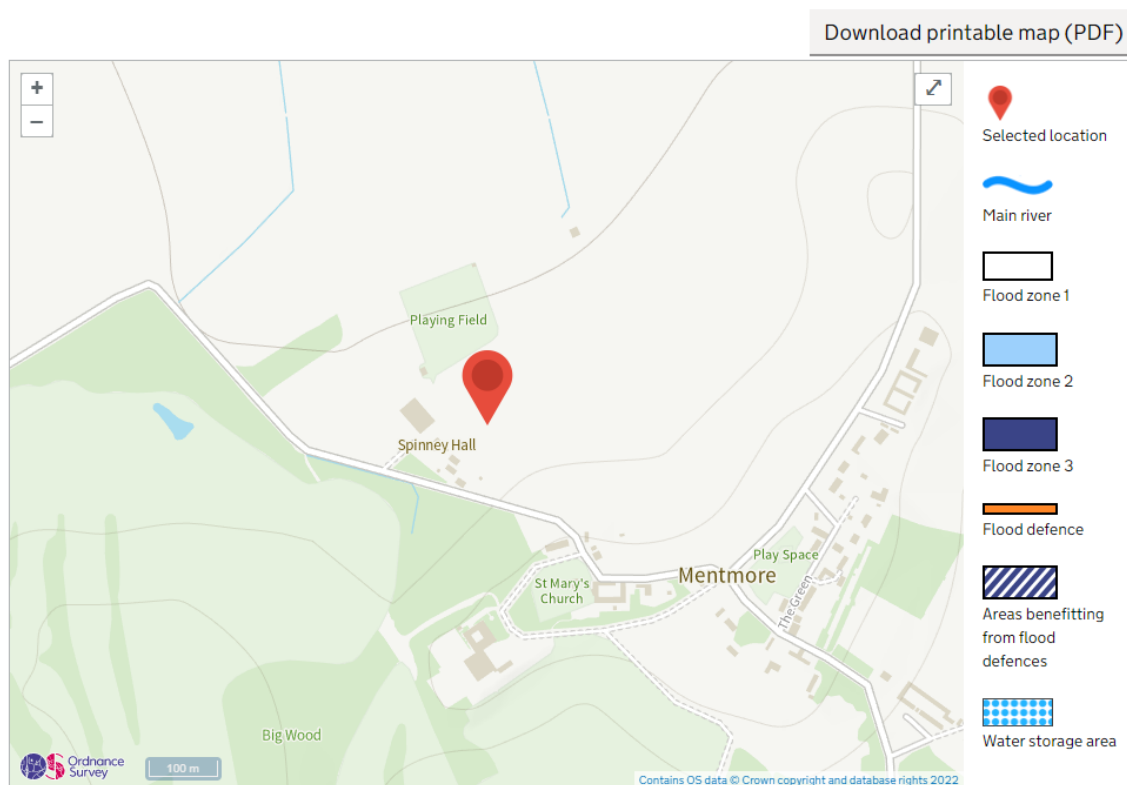


Figure 4: Flood Map for Planning © gov.uk

3.1.4 Minor flood risks to the site are considered as follows:

3.2 Fluvial

3.2.1 The nearest significant watercourse is the Grand Union Canal approximately 2.4km to the east off the Application Site.

3.3 Localised flooding caused by ground water

3.3.1 There is no known history of flooding of the site from groundwater sources.



3.4 Localised flooding caused by overland surface water runoff

3.4.1 The general topography of the site slopes gently downwards towards the north. The EA 'Risk of Flooding from Surface Water' does not indicate a specific risk and on this basis the Site is considered to be at a low risk from surface water flooding.

3.5 Other sources of flooding

3.5.1 There are not any canals, reservoirs or other forms of watercourse upstream of the site to be a potential source other than those already mentioned.

3.5.2 Our assessment of the above flood risks indicates that the site is not within a flood risk area.

4.0 Summary and Conclusions

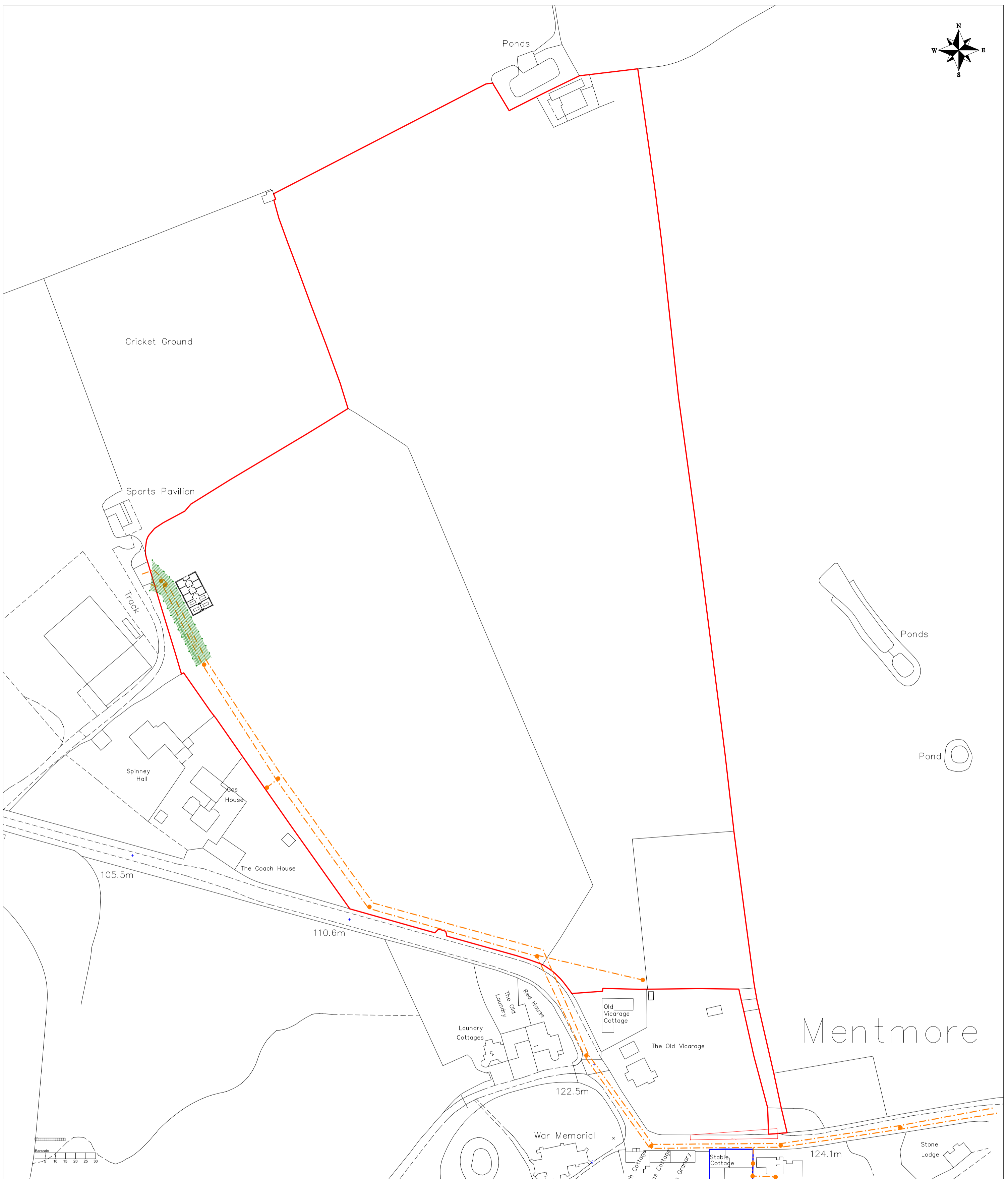
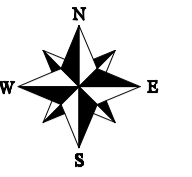
4.1.1 The Application Site lies within Flood Risk Zone 1 as indicated on the EA flood map. On this basis the site is considered to be at a low risk of flooding.

4.1.2 Surface water runoff from a barn housing stables and ancillary storage will discharge directly to the ground. The area of porous surface is not significantly reduced. The proposal for the change of use of land to mixed agricultural and equestrian use to allow for the keeping of horses and siting of equestrian barn will have no impact on the risk of flooding and no flood risk reduction measures are required.



APPENDIX 1

Site Location Plan



Client:	Elizabeth Hough
Project:	COU to Equestrian & Stables
Property:	22 Acre Paddock, Mentmore
Drawing Name:	Proposed Site Location Plan
Reference:	2758_11783_002
Revision:	1
Scale:	1:1250 (A2)
Date:	28 March 2022

BRIGGS & STONE
land & property consultants





APPENDIX 2

British Geological Survey Geology

The BGS Lexicon of Named Rock Units — Result Details

Gault Formation

Computer Code:	GLT	Preferred Map Code:	G
Status Code:	Full		
Age range:	Albian Age (KA) — Albian Age (KA)		
Lithological Description:	<p>Pale to dark grey or blue-grey clay or mudstone, glauconitic in part, with a sandy base. Discrete bands of phosphatic nodules (commonly preserving fossils), some pyrite and calcareous nodules. At Munday's Hill, Bedfordshire the base of the Gault Formation is brick-red mudstone called informally the "Cirrpede Bed". In Norfolk, the Gault Formation becomes calcareous before passing northwards into the Hunstanton Formation ("Red Chalk"). In places thin, variable junction beds at the base include some limestones.</p> <p>The base is an unconformity. There is a rapid transition from sands of the Lower Greensand Group and equivalents where these are present or a marked break where the basal Gault Formation rests on rocks down to Triassic in age. Beneath London the lower part of the Gault Formation is absent or severely attenuated over the London-Brabant Ridge (formed of Palaeozoic rocks). Generally the base of the Gault Formation is taken at the base of a phosphatic pebble bed or gritty mudstone where it overlies the Carstone in East Anglia, the Monk's Bay Sandstone Formation on the Isle of Wight or the Folkestone Formation of the Weald. Elsewhere in southern England the base of the Gault Formation rests on an unconformity and oversteps onto undivided Lower Greensand Group sandstones and ironstone, may overlie attenuated Wealden, and oversteps onto various units of the Jurassic. In the extreme west of the outcrop the overstep places the Gault Formation on Triassic mudstones and sandstones.</p> <p>The top of the formation is a diachronous transition from mudstone into Upper Greensand Formation facies (glauconitic sand) westward of a line from Sevenoaks (Kent) to Lewes (Sussex). In eastern areas the upper boundary of the formation is the unconformable junction with the basal Grey Chalk Subgroup (argillaceous, glauconitic sandstone, chalky sandstone and sandy chalk, with common phosphatic nodules). In Cambridgeshire the mudstones of the Gault Formation are overlain at a sharp erosive junction by the strongly phosphatic sandstone of the Cambridge Greensand Member at the base of the Chalk Group (West Melbury Marly Chalk Formation).</p>		
Definition of Lower Boundary:			
Definition of Upper Boundary:			
Thickness:	About 2m in north Norfolk, thickening southwards to 20m in Cambridgeshire, 60m in Bedfordshire, and 90 to 110m in the Weald (104m in the Glyndebourne Borehole TQ41SW/16 [TQ4420 1141]).		
Geographical Limits:	Extensive outcrop in eastern England from Norfolk, southwestwards across the East Midlands and Home Counties to Devon, in the Isle of Wight and around the margins of the the Weald.		
Parent Unit:	Selborne Group (SELB)		
Previous Name(s):	Gault (-2208) Gault Clay (-2209) Blue Marl (-123) Gault Clay Formation (-1565) Blue Marle (-3435) Golt (-934)		
Alternative Name(s):	<i>none recorded or not applicable</i>		
	Stratotypes:		
Type Section	Long regarded as Copt Point cliff section at Folkestone, Kent (Price, 1874; Topley, 1875; Jukes-Browne and Hill, 1900; Owen, 1971). Full succession visible. Divided into beds (I-XIII). See Smart et al. (1966).		
Reference Section	The three boreholes (1 to 3) at Selborne in Hampshire (SU73SW/22 [7320 3494], SU73SE/39 [7540 3435] and SU73SE/40 [7583 3400]). Boreholes together give a complete lower and upper Gault Formation succession (Hopson, Farrant and Booth, 2001).		
Reference Section	Gayton Borehole TF71NW/10 [7280 1974] (Gallois and Morter, 1982). The full succession was cored between 11.50 and 22.00m depth.		
Reference Section	The Arlesey Borehole (Arlesey Brickpit, SE Bedfordshire) TL13SE/45 [1887 3463]. The borehole shows a complete section through the preserved Gault Formation 15.45 to 72.96m depth (Hopson, 1992; Woods, Wilkinson and Hopson, 1995).		
Reference Section	Marham Borehole TF70NW/1 [7051 0803] (Gallois and Morter, 1982). The full thickness of the formation was cored between 33.43 and 45.03m depth.		
Reference Section	Mundford C Borehole TL79SE/13 [7670 9132] (Gallois and Morter, 1982). Full succession between 89.59 and 107.87m depth		

Reference(s):

- Hopson, P M, Farrant, A R and Booth, K A. 2001. Lithostratigraphy and regional correlation of the basal Chalk, Upper Greensand, Gault and Uppermost Folkestone formations (Mid-Cretaceous) from cored boreholes near Selborne, Hampshire. Proceedings of the Geologists' Association, Vol.112, 193-210.
- Hailstone, J. 1816. Outlines of the geology of Cambridgeshire. Transactions of the Geological Society of London, Vol.3, 243-250.
- Price, F G H. 1874. On the Gault of Folkestone. Quarterly Journal of the Geological Society of London, Vol.30, 342-366.
- Rawson, P F, Curry, D, Dilley, F C, Hancock, J M, Kennedy, W J, Neale, J W, Wood, C J and Worrasm, B C. 1978. A correlation of Cretaceous rocks in the British Isles. Geological Society of London, Special Report No.9.
- Owen, H G. 1972. The Gault and its junction with the Woburn Sands in the Leighton Buzzard area, Bedfordshire and Buckinghamshire. Proceedings of the Geologists' Association, Vol.83, 287-312.
- Owen, H G. 1992. The Gault-Lower Greensand Junction Beds in the northern Weald (England) and Wissant (France), and their depositional environment. Proceedings of the Geologists' Association, Vol.103, 83-110.
- Woods, M A, Wilkinson, I P and Hopson, P M. 1995. The stratigraphy of the Gault Formation (Middle and Upper Albian) in the BGS Arlesey Borehole, Bedfordshire. Proceedings of the Geologists' Association, Vol.106, 271-280.
- Hopson, P M. 1992. Geology of the Letchworth, Northwest Hitchin and Holwell district, Hertfordshire. 1:10 000 Sheets TL 13SE and TL 23 SW. British Geological Survey Technical Report, WA/92/42.
- Jukes-Browne, A J and Hill, W. 1900. The Cretaceous Rocks of Britain. 1. Gault and Upper Greensand. Memoir of the Geological Survey of Great Britain.
- Hancock, J M (Editor). 1972. Cretace. Ecosse, Angleterre, Pays de Galles. Lexique Stratigraphique International, Vol.1, fascicule 3a XI.
- Owen, H G. 1971. Middle Albian stratigraphy in the Anglo-Paris basin. Bulletin of the British Museum (Natural History): Geology, Supp.8, 1-164.
- Smart, J G O, Bisson, G and Worrasm, B C. 1966. Geology of the Country around Canterbury and Folkestone. Memoir of the Geological Survey of Great Britain, Sheets 289, 305 and 306 (England and Wales).
- Topley, W. 1875. The geology of the Weald. Memoir of the Geological Survey of England and Wales.
- Waters, C N, Smith, K, Hopson, P M, Wilson, D, Bridge, D M, Carney, J N, Cooper, A H, Crofts, R G, Ellison, R A, Mathers, S J, Moorlock, B S P, Scrivener, R C, McMillan, A A, Ambrose, K, Barclay, W J, and Barron, A J M. 2007. Stratigraphical Chart of the United Kingdom: Southern Britain. British Geological Survey, 1 poster.

1:50K maps on which the lithostratigraphical unit is found, and map code used:

[E129](#) [E145](#) [E146](#) [E160](#) [E161](#) [E162](#) [E173](#) [E175](#) [E176](#) [E187](#) [E188](#) [E189](#) [E190](#) [E203](#) [E204](#) [E205](#) [E206](#) [E207](#) [E208](#) [E219](#) [E220](#) [E221](#) [E222](#) [E225](#) [E236](#) [E237](#) [E238](#) [E239](#) [E240](#) [E252](#) [E253](#) [E254](#) [E256](#) [E257](#) [E258](#) [E259](#) [E266](#) [E267](#) [E268](#) [E269](#) [E270](#) [E271](#) [E272](#) [E273](#) [E274](#) [E281](#) [E282](#) [E283](#) [E284](#) [E285](#) [E298](#) [E300](#) [E326](#) [E327](#) [E340](#) [E341](#) [E342](#) [E343](#)

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APPENDIX 3

**SP92SW260 — Mentmore Buckinghamshire 1
(490180, 220010) Depth: 8.5m.**



[Report an issue with this borehole](#)



LOCATION : Mentmore

BOREHOLE No. One

DATE OF BORING: 10.04.1989

Description of Strata	STRATA CHANGE			SAMPLES		SPT CPT N-VALUE	WATER LEVEL M
	LEGEND	DEPTH M	O.D. LEVEL M	DEPTH M	TYPE		
Dark brown TOPSOIL with some brick and ash - FILL.							
BOULDER CLAY Firm, grey green, mottled black, silty CLAY with occasional fine gravel and some rootlets down to 1m.		1.00		1.00	J	8	
- becoming firm to stiff		2.00		2.00	J	12	
- stiff, dark green, grey		3.00		3.00	J	12	
- medium to dark grey		4.00		4.00	J	14	
- stiff to very stiff, with occasional pockets of a medium brown, fine, gravelly sand		5.00		5.00	J	17	
		6.00		6.50	J	14	
		7.00					
- very stiff, fissured, dark grey		8.00		8.00	J	16	
		9.00					
		10.00					Dry

BOREHOLE DIAMETER : 150mm

LINING TUBES : 150mm to 1.50m

GROUND LEVEL : -

REMARKS : Borehole drilled from existing ground level

∇ - Water strike
 ▽ - Water (standing level)
 W - Water Sample
 B/J - Bulk/Jar Sample
 S.P.T. - Standard Penetration Test
 C.P.T. - Cone Penetration Test
 (U) - Undisturbed Sample (38mm & 100mm)

Date.
April 1989

BOREHOLE LOG

Report No.
S.1172



APPENDIX 4

SP91NW26 — Mentmore Buckinghamshire 2 (490440, 219870) Depth: 8.5m.

[Report an issue with this borehole](#)

LOCATION : Mentmore

BOREHOLE No. Two

DATE OF BORING: 10.04.1989

Description of Strata	STRATA CHANGE			SAMPLES		SPT CPT N-VALUE	WATER LEVEL M
	LEGEND	DEPTH M	O.D. LEVEL M	DEPTH M	TYPE		
Dark brown clayey TOPSOIL.							
BOULDER CLAY Soft to firm, yellow beige brown silty CLAY with very occasional fine gravel.		1.00		1.00	J	8	
- firm to stiff, beige grey		2.00		2.00	J	16	
		3.00		3.00	J	18	
		4.00		4.00	J	15	
- stiff slightly fissured		5.00		5.00	J	17	
becoming dark grey		6.00		6.50	J	19	
GAULT CLAY Stiff, slightly fissured dark grey silty CLAY with very occasional fine gravel and some shell fragments.		8.00		8.00	J	19	
		9.00					
		10.00					Dry

BOREHOLE DIAMETER : 150mm

LINING TUBES : 150mm to 1.50m

GROUND LEVEL : -

REMARKS : Borehole drilled from existing ground level

- ∇ - Water strike
- ∩ - Water (standing level)
- W - Water Sample
- B/J - Bulk/Jar Sample
- S.P.T. - Standard Penetration Test
- C.P.T. - Cone Penetration Test
- (U) - Undisturbed Sample (38mm & 100mm)

Date.
April 1989

BOREHOLE LOG

Report No.
S.1172



APPENDIX 5

SP91NW24 – Mentmore Mansion (490260, 219720) Depth 200ft



RECORD OF WELL (SHAFT OR BORE)

SP91/43
For Survey use only
N.
220
278
Licence No.

EXACT SITE OF WELL

At MENTMORE MANSION
(Residence of Lord Rothery)
Town or Village MENTMORE
County Bucks Six-inch quarter sheet 24 SE.W
For SP 9026 1972 State whether owner, tenant, builder, contractor, consultant, etc.:-

Address (if different from above).....
Level of ground surface above sea-level (O.D.) + c.400 ft. If well-top is not at ground level, state how far .. { above: .. below;ft.
SHAFT 200 ft.; diameter 4 ft.; Full details of headings (dimensions and directions)

BORE Depth unknown ft.; diameter of bore: at top.....ins.; at bottom.....ins.
Full details of permanent lining tubes (position, length, diameter, plain, slotted etc.).....

TEST CONDITIONS

Water struck at depths of.....ft. below well-top.
Rest level of water.....ft. above well-top. Suction at.....ft. Yield on.....hours' test days' test
pumping at.....galls. per.....with depression to.....ft. below well-top.
Recovery to rest-level in.....mins. Capacity of pump.....g.p.h. Date of measurements.....hours

NORMAL CONDITIONS

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:
Make and/or type.....Motive power.....
Capacity.....gallons per hour. Suction at.....ft.
Amount pumped.....galls. per day. Estimated consumption.....galls. per week.
Well made by..... Date of well 1850 Old
Information from in field.

ADDITIONAL NOTES

ANALYSIS (please attach copy if available)
Visited and sited by O on 6" Bucks 24 SE.W.
o.d. welltop + 400. Disused.
R.W.L. 171' 8 1/2" below well top. 26/6/59. H.C.
Visited.
R.W.L. 156' 9" b.s.
(If measurements are required in future, contact Mr Pennell at
Waterworks, Model Farm (238/28)
22/9/60 B.H.

37583 12 000 8/54 JC&S Gp689

(1527) Dd574/W1

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

Section 6.

Date
Received

1" O.S. Map
No.

Site marked
on 1" Map

(use symbol)
on 6" Map

220

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British Geological Survey

British Geological Survey

British Geological Survey




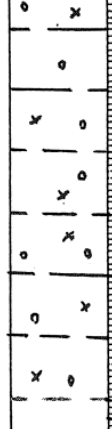
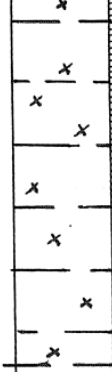
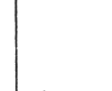
APPENDIX 6

**SP91NW27 - Mentmore Buckinghamshire 3
(490650,219770) Depth: 4.5m**

LOCATION : Mentmore

BOREHOLE No. Three

DATE OF BORING: 06.04.1989

Description of Strata	STRATA CHANGE			SAMPLES		SPT CPT	WATER LEVEL M
	LEGEND	DEPTH M	O.D. LEVEL M	DEPTH M	TYPE	N-VALUE	
<p>TOPSOIL Loose, medium brown, mottled black, organic silty clayey SAND with fine to medium gravel, grass and rootlets; abundant pockets of medium brown clay.</p>		1.00		1.00	B	9	
<p>BOULDER CLAY Stiff, dark grey, slightly silty CLAY with occasional fine chalky gravel.</p>		2.00		2.00	J	17	
<p>GAULT CLAY Stiff to very stiff, friable olive beige silty CLAY with some iron staining.</p>		3.00		3.00	J	19	
<p>- becoming medium to dark grey</p>		4.00		4.00	J	20	
		5.00					Dry

BOREHOLE DIAMETER : 150mm

LINING TUBES : 150mm to 1.50m

GROUND LEVEL : -

REMARKS : Borehole drilled from existing ground level

X - Water strike
 Y - Water (standing level)
 W - Water Sample
 B/J - Bulk/Jar Sample
 S.P.T. - Standard Penetration Test
 C.P.T. - Cone Penetration Test
 (U) - Undisturbed Sample (38mm & 100mm)

Date.
April 1989

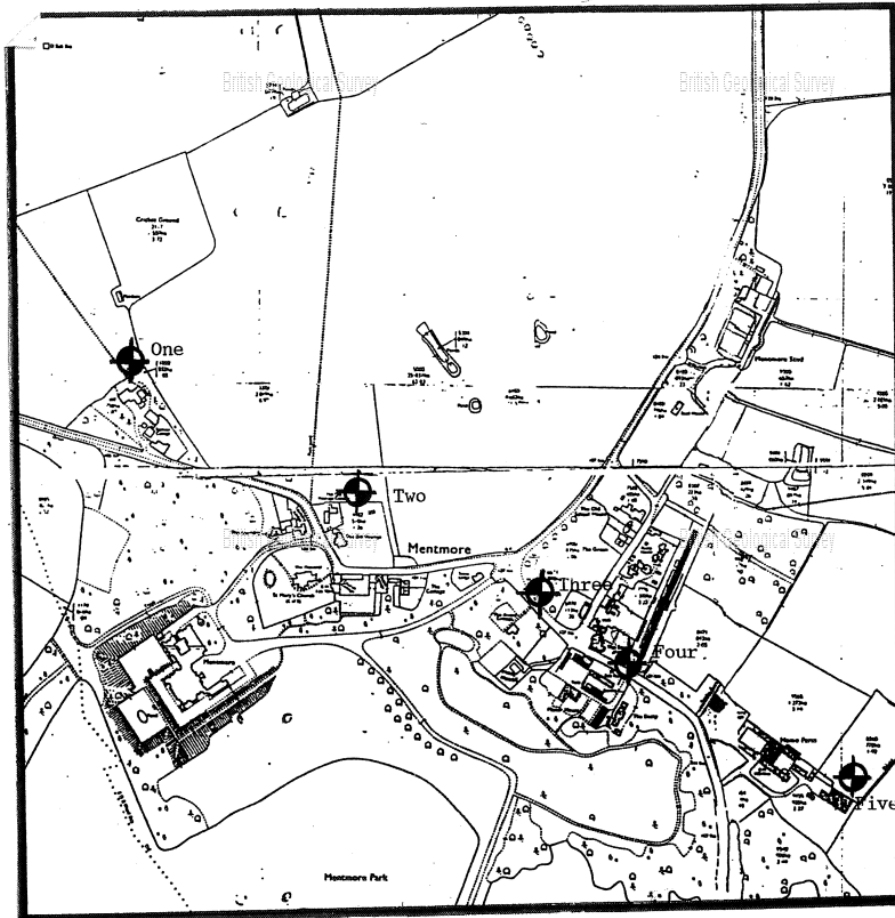
BOREHOLE LOG


Report No.
S.1172



[Report an issue with this borehole](#)





 Borehole Location

Scale 1 : 7087

<p>Date April 1989</p>	<p>BOREHOLE LOCATION PLAN</p>	<p>Report No. S.1172</p>
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TYRONE

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Incorporated in England & Wales 11328499

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