

**AGRICULTURAL QUALITY
OF LAND OFF BODNANT AVENUE
PRESTATYN**

Report 2492/1

29th November 2024

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**AGRICULTURAL QUALITY
OF LAND OFF BODNANT AVENUE, PRESTATYN**

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Report 2492/1
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SUMMARY

An agricultural land quality survey has been undertaken of 2.3 ha of land off Bodnant Avenue, Prestatyn in October 2024.

The land has a mix of fine loamy slowly permeable soils and calcareous freely-draining loamy soils. Agricultural quality is limited to Grade 2 and Subgrade 3a by wetness.

1.0 Introduction

- 1.1 This report provides information on the agricultural quality of 2.3 ha of land off Bodnant Avenue, Prestatyn. The report is based on a survey of the land in October 2024.

SITE ENVIRONMENT

- 1.2 The survey area comprises a single field, bounded to the west and north-west by Bodnant Avenue, to the north by Ffordd Parc Bodnant and Prestatyn Road, to the south by Nant Hall Road, and to the east by a caravan park. The land slopes gently from south to north, with an average elevation of approximately 10 m AOD.
- 1.3 The land is under grass, ungrazed at the time of survey.

PUBLISHED INFORMATION

- 1.4 British Geological Survey 1:50,000 scale information records the underlying geology as Pennine Coal Measures, mainly with a cover of Devensian glacial till. A small area of sand and gravel deposits is recorded in the west.
- 1.5 The National Soil Map (published at 1:250,000 scale) records the land as East Keswick 3 Association: mainly freely draining soils formed in fine loamy drift¹. Land to the west of the site is recorded as Salop Association: mainly fine textured soils with drainage restrictions formed in reddish glacial till.
- 1.6 The Welsh Government Predictive Agricultural Land Classification map² shows the land as Grade 1.

¹ Rudeforth, C. C., *et al.*, 1984. *Soils and their use in Wales*. Soil survey of England and Wales, Bulletin No. 11, Harpenden.

² [New map | DataMapWales \(gov.wales\)](#)

2.0 Soils

- 2.1 A soils and agricultural land quality survey was carried out in November 2024 in accordance with MAFF (1988) Agricultural Land Classification guidelines³. It was based on observations at alternate intersects of a 50 m grid, giving a density of two observations per hectare. One observation (point 5 of Map 1) was close to the site boundary and was relocated.
- 2.2 During the survey, soils were examined by hand augerings and pits to a maximum depth of 1.2 m. A log of the sampling points and a map (Map 1) showing their location is in an appendix to this report.
- 2.3 The soils were found to vary, primarily in texture drainage and carbonate status, as described below.

LOAMY CALCAREOUS SOILS

- 2.4 These soils are found in the west of the site. They appear to be formed in calcareous deposits, possibly disturbed/placed material from excavation works elsewhere: these soils do not match the mapped geology or soils of the site. They comprise very calcareous heavy clay loam topsoil and upper subsoil, over calcareous fine sandy loam lower layers. The soils are greyish and mottled in places, but it is not clear whether this reflects seasonally shallow groundwater at the site, or is a relict feature of introduced material. However, these soils are permeable to depth and judged freely-draining with agricultural improvement (Soil Wetness Class I/II). Disturbed soils with over-deepened topsoils were found at one observation point (point 1 of Map 1) but are included in this soil type for grading purposes.
- 2.5 An example soil profile described from a pit at excavation at point 4 is attached to this report as an appendix.

FINE LOAMY SLOWLY PERMEABLE SOILS

- 2.6 These soils are found in the south-east of the site. They comprise sandy clay loam topsoil over permeable sandy clay loam or clay loam upper subsoil. The lower subsoil is a slowly permeable reddish clay loam or sandy clay loam. The subsoils show evidence of seasonal waterlogging (pale ped faces and greyish/ochreous mottles and/or ferri-manganiferous concentrations) caused by perched surface water. These soils are judged imperfectly-draining (Soil Wetness Class III)

³MAFF, (1988). *Agricultural Land Classification for England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land*.

2.7 An example soil profile described from a pit at excavation at point 3 is attached to this report as an appendix.

3.0 Agricultural land quality

3.1 To assist in assessing land quality, the Ministry of Agriculture, Fisheries and Food (MAFF) developed a method for classifying agricultural land by grade according to the extent to which physical or chemical characteristics impose long-term limitations on agricultural use for food production. The MAFF ALC system classifies land into five grades numbered 1 to 5, with grade 3 divided into two subgrades (3a and 3b). The system was devised and introduced in the 1960s and revised in 1988.

3.2 The agricultural climate is an important factor in assessing the agricultural quality of land and has been calculated using the Climatological Data for Agricultural Land Classification⁴.

3.3 The relevant site data for an average elevation of 10 m and a central point at grid reference SJ 072,831 is given below.

- Average annual rainfall: 682 mm
- January-June accumulated temperature >0°C 1457 day°
- Field capacity period 167 days
- Summer moisture deficits for:
wheat: 104 mm
potatoes: 95 mm

3.4 The survey described in the previous section was used in conjunction with the agro-climatic data above to classify the site using the revised guidelines for ALC issued in 1988 by MAFF⁵. There are no overriding climatic limitations at this locality.

SURVEY RESULTS

3.5 The agricultural quality of the land is primarily determined by wetness limitation. Other factors have been assessed but do not affect the land grade. Land of Grades 2 and 3 has been identified.

Grade 2

3.6 This land has loamy calcareous soils (see paragraph 2.4). the high clay content of the topsoil means there are likely to be some restrictions to cultivation operations in winter and early spring but rarely at other times of year.

Subgrade 3a

3.7 This land has slowly permeable loamy soils (see paragraph 2.6). The combination of moderately high topsoil clay content and imperfect drainage (Soil Wetness Class III)

⁴Meteorological Office, (1989). *Climatological Data for Agricultural Land Classification*.

⁵MAFF, (1988). *Agricultural Land Classification for England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land*.

means that machinery access is likely to be restricted in winter and early spring, although late spring (as well as autumn) sowings are generally possible.

Grade areas

- 3.1 The land grades are shown on Map 2 and the areas occupied shown below.

Table 1: Areas occupied by the different land grades (ha)

<i>Grade/subgrade</i>	<i>Area (ha)</i>	<i>% of the land</i>
Grade 2	1.56	67
Subgrade 3a	0.75	33
Total	2.3	100

APPENDIX
DETAILS OF OBSERVATIONS
MAPS
LABORATORY ANALYSIS

Land off Bodnant Avenue, Prestatyn: Soils and ALC survey – Details of observations at each sampling point

Obs No	Topsoil			Upper subsoil			Lower subsoil			Slope	Wetness	Agricultural quality	
	Depth (cm)	Texture	Stones >20 mm (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling	(°)	Class	Grade	Main limitation
1	0-65+	SCL(dist)	<5							1	-	-	-
2	0-42	HCLvca	<5	52-76	HCLxca	o	70-100+	FSLca	o	1	I	2	W
3	0-23	SCL	<5	23-58	HCL(r)	xxx	58-100+	HCL(r)	xxx	4	III	3a	W
4	0-25	HCLvca	<5	25-40	slstHCLvca	o	40-58 58-120	HCLxca FSLca	xx(x) xxx	3	I/II	2/3a	W
5	0-23	SCLca	<5	23-53	SCL	o	53-90+	SCL(r)	xx(x)	4	III	3a	W

Soil log key

Gley indicators¹

o	unmottled
x	1-2% ochreous mottles and brownish matrix (or a few to common root mottles (topsoils)) ³
xx	>2% ochreous mottles and brownish matrix and/or dull structure faces (slightly gleyed horizon)
xxx	>2% ochreous mottles and greyish or pale matrix (gleyed horizon) or reddish matrix and >2% greyish, brownish or ochreous mottles and pale ped faces mottles or fmn concentrations (gleyed horizon)
xxxx	dominantly blueish/greenish matrix, often with some reddish mottles (gleyed horizon)

Slowly permeable layers⁴

a depth underlined (e.g. 50) indicates the top of a slowly permeable layer

A wavy underline (e.g. 50) indicates the top of a layer borderline to slowly permeable

¹Gley indicators in accordance with Hodgson, J.M., 1997. Soil Survey Field Handbook (third edition). Soil survey technical monograph No. 5

²Texture in accordance with particle size classes in Hodgson (1997)

³ Occasionally recorded in the texture box

⁴Permeability is estimated for auger borings and must be confirmed by full pit observations in accordance with the definitions in: Revised Guidelines for grading the quality of Agricultural Land (Maff 1988)

⁵Soil Wetness Classes are defined in Hodgson (1997)

⁷calcareous classes as defined in Hodgson (1997)

Grades shown as intergrade e.g. **3a/3b** are close to the grade boundary. The estimate of which side of the boundary the grading falls is the shown first (in bold here) grades in brackets eg. (3a) raised by one grade due to calcareous topsoil

Texture²

C	clay
ZC	silty clay
SC	sandy clay
CL	clay loam (H-heavy, M-medium)
ZCL	silty clay loam (H-heavy, M-medium)
SZL	sandy silt loam (F-fine, M-medium, C-coarse)
LS	loamy sand (F-fine, M-medium, C-coarse)
SL	sandy loam (F-fine, M-medium, C-coarse)
S	sand (F-fine, M-medium, C-coarse)
SCL	sandy clay loam
P	peat (H-humified, SF-semi-fibrous, F-fibrous)
LP	loamy peat; PL - peaty loam

Wetness Class⁵

I (freely drained) to VI (very poorly drained)

⁶stoniness classes as defined in Hodgson (1997)

Limitations:

W	wetness/workability
D	droughtiness
De	depth
F	flooding
St	stoniness
G	gradient
T	topography/microrelief
C	Climate

Suffixes & prefixes:

o - organic

(vsl, sl, m, v, x)**st** – (very slightly, slightly, moderately, very, extremely) **stony**⁶

(vsl, sl, m, v, x)**ca**
(very slightly, slightly, moderately, very, extremely) **calcareous**⁷

Other abbreviations

fmn - ferri-manganiferous concentrations
dist - disturbed soil layer; chky - chalky
R – bedrock (CH – chalk, SST – sandstone)
LST – limestone, MST – Mudstone
r-reddish, gn – greenish

SOIL PIT DESCRIPTIONS

Observation 3

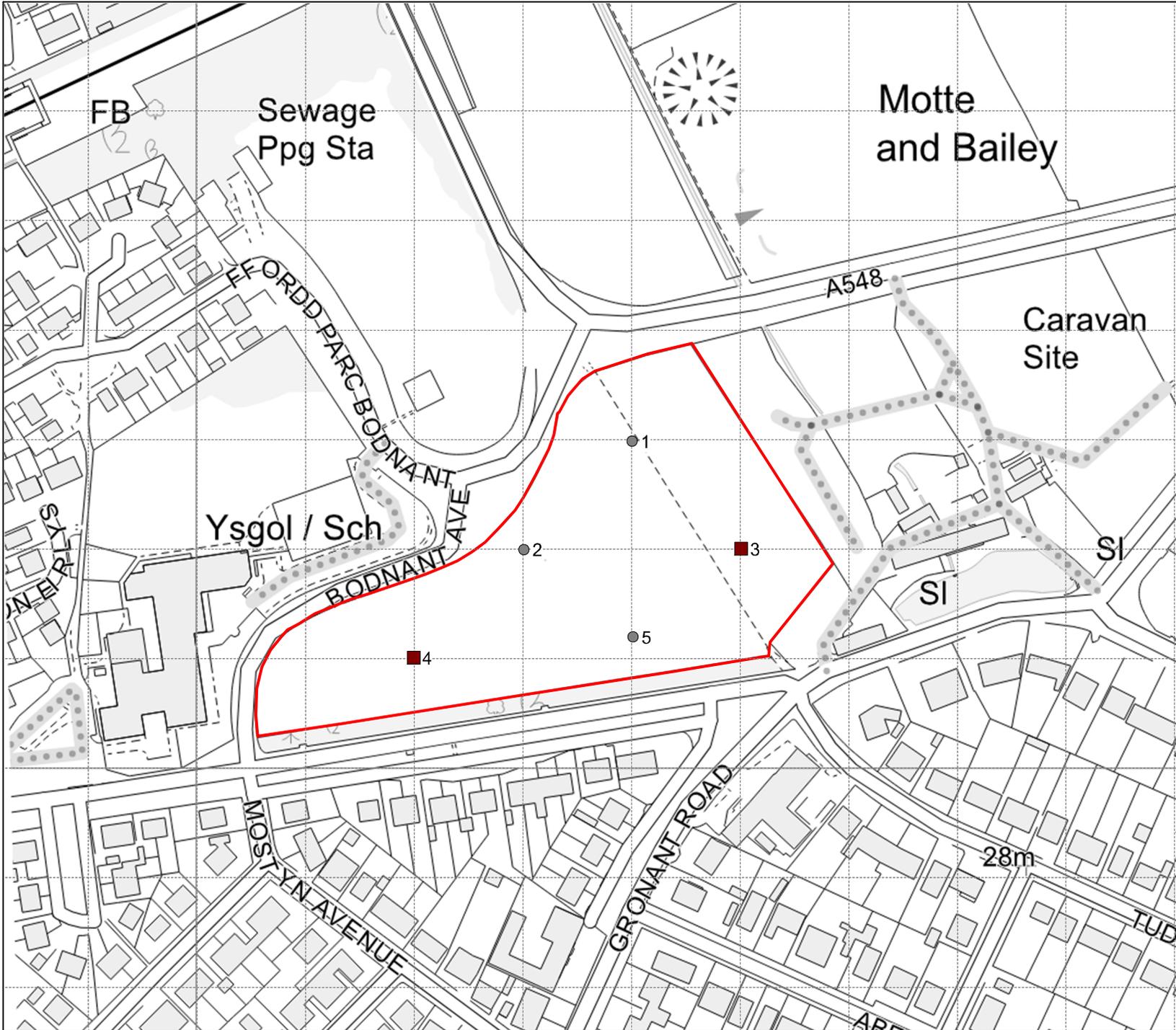
- 0-23 cm Dark greyish brown (10YR 4/2) sandy clay loam; 5% medium hard mixed stones; moderately developed coarse sub-angular blocky structure; friable; common fine fibrous roots;; gradual smooth boundary to:
- 23-58 cm Reddish brown (5YR 5/4) heavy clay loam with 2% very fine very dark grey (5YR 3/1) ferri-manganiferous concentrations and greyish (5YR 5/3) ped faces; very slightly stony; moderately developed medium sub-angular blocky structure; friable; few fine fibrous roots; non-calcareous; gradual smooth boundary to:
- 58-100 cm+ Reddish brown (5YR 5/4) heavy clay loam with 5% fine yellowish red (5YR 5/8) mottles, 5% fine very dark grey (7.5YR 5/8) ferri-manganiferous concentrations and pinkish grey (5YR 6/2) ped faces; very slightly stony; moderately developed coarse angular blocky structure; firm; <0.5% macro-pores; few fine fibrous roots; non-calcareous.



Observation 4

- 0-25 cm Very dark greyish brown (10YR 3/2) heavy clay loam 5% hard mixed stones; moderately developed medium sub-angular blocky structure; friable; many fine fibrous roots; very calcareous; gradual smooth boundary to:
- 25-40 cm Brown (10YR 6/2) heavy clay loam with 5% small soft limestone fragments/ carbonate concretions and 5% small coal fragments; moderately developed medium sub-angular blocky structure; friable; common fine fibrous roots; very calcareous; gradual smooth boundary to:
- 40-58 cm White (10YR 8/1) heavy clay loam with 5% medium yellowish red (7.5YR 6/8) mottles; very slightly stony; moderately developed coarse sub-angular blocky structure; friable; extremely calcareous; few fine fibrous roots; smooth clear boundary to:
- 58-120 cm Greenish grey (10Y 6/1) fine sandy loam with 10% medium and coarse yellowish brown (10YR 4/6) mottles; 25-30% hard mixed sub-angular stones; weakly developed coarse sub-angular blocky structure; friable; very calcareous; no roots.





KEY

- Auger observations
- Pits
- Site boundary

Site:

Bodnant Avenue
Prestatyn

Map title:

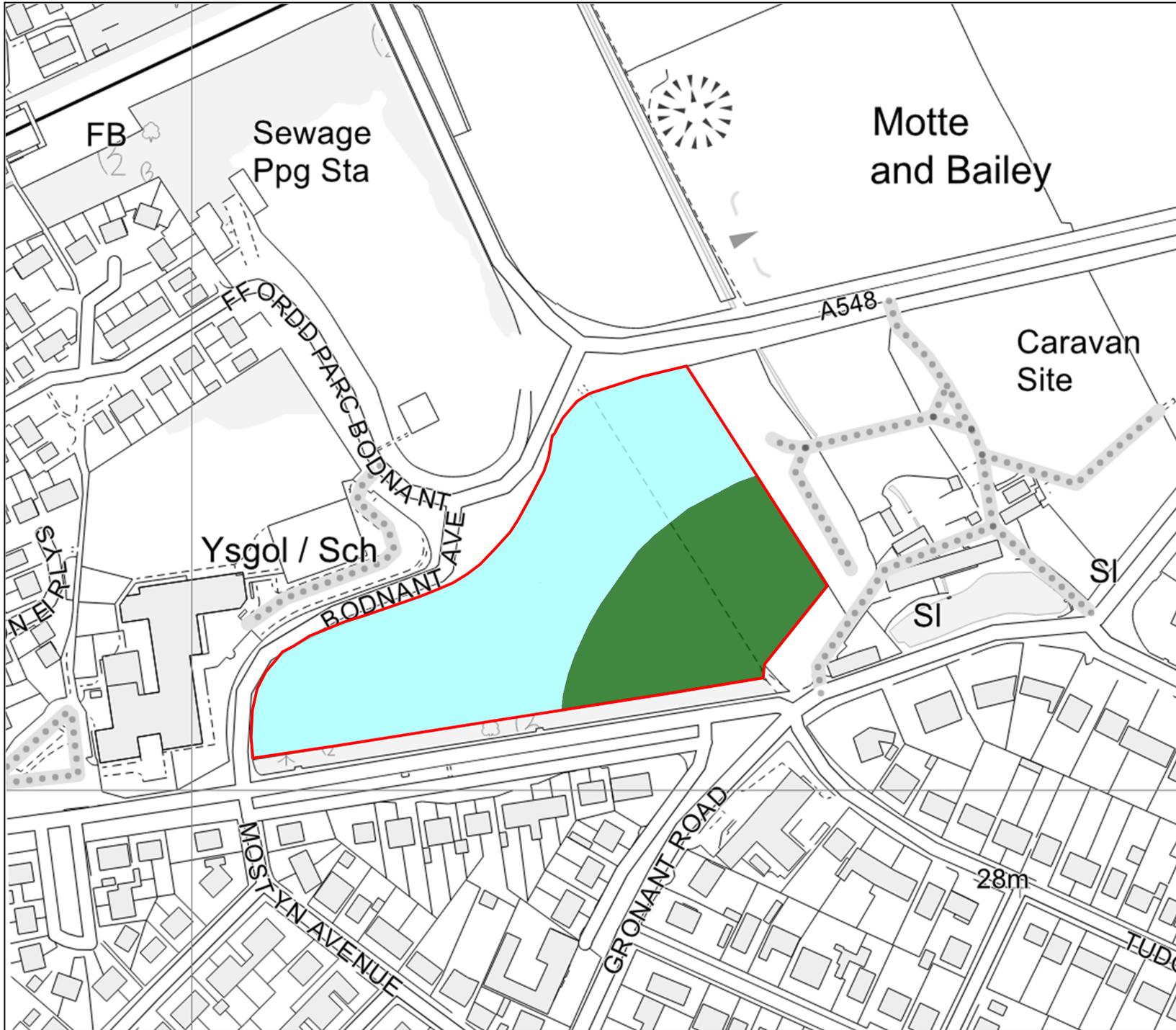
MAP 1
Observations

Land
Research
ASSOCIATES

Tapton Innovation Centre
Brimington Road
Chesterfield
S41 0TZ
www.lra.co.uk

Date: 29/11/2024

Scale: 1:2,500



KEY

- Grade 2
- Subgrade 3a
- Site boundary

Site:

Bodnant Avenue
Prestatyn

Map title:

MAP 2
Agricultural Land
Classification

Land
Research
ASSOCIATES

Tapton Innovation Centre
Brimington Road
Chesterfield
S41 0TZ
www.lra.co.uk

Date: 29/11/2024

Scale: 1:2,500

ANALYTICAL REPORT

Report Number	64408-24	H579	MR MIKE PALMER
Date Received	11-NOV-2024		LAND RESEARCH ASSOCIATES
Date Reported	25-NOV-2024		TAPTON PARK INNOVATION
Project	SOIL		CENTRE
Reference	BODNANT AVENUE		BRIMINGTON ROAD
Order Number			CHESTERFIELD S41 0TZ

Laboratory Reference		SOIL722789	SOIL722790							
Sample Reference		3	4							
Determinand	Unit	SOIL	SOIL							
Sand 2.00-0.063mm	% w/w	52	41							
Silt 0.063-0.002mm	% w/w	25	30							
Clay <0.002mm	% w/w	23	29							
Textural Class **		SCL	HCL							

Notes

Analysis Notes	The sample submitted was of adequate size to complete all analysis requested. The results as reported relate only to the item(s) submitted for testing. The results are presented on a dry matter basis unless otherwise stipulated.
Document Control	This test report shall not be reproduced, except in full, without the written approval of the laboratory.

Reported by	<p>** Please see the attached document for the definition of textural classes.</p> <p><i>Gabrielle Parkes</i> Natural Resource Management, a trading division of Cawood Scientific Ltd. Coopers Bridge, Braziers Lane, Bracknell, Berkshire, RG42 6NS Tel: 01344 886338 Fax: 01344 890972 email: enquiries@nrm.uk.com</p>
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ADAS (UK) Textural Class Abbreviations

The texture classes are denoted by the following abbreviations:

Class	Code
Sand	S
Loamy sand	LS
Sandy loam	SL
Sandy Silt loam	SZL
Silt loam	ZL
Sandy clay loam	SCL
Clay loam	CL
Silt clay loam	ZCL
Clay	C
Silty clay	ZC
Sandy clay	SC

For the *sand*, *loamy sand*, *sandy loam* and *sandy silt loam* classes the predominant size of sand fraction may be indicated by the use of prefixes, thus:

- vf Very Fine (more than 2/3's of sand less than 0.106 mm)
- f Fine (more than 2/3's of sand less than 0.212 mm)
- c Coarse (more than 1/3 of sand greater than 0.6 mm)
- m Medium (less than 2/3's fine sand and less than 1/3 coarse sand).

The subdivisions of *clay loam* and *silty clay loam* classes according to clay content are indicated as follows:

- M medium (less than 27% clay)
- H heavy (27-35% clay)

Organic soils i.e. those with an organic matter greater than 10% will be preceded with a letter O.

Peaty soils i.e. those with an organic matter greater than 20% will be preceded with a letter P.