

PHYSICAL CHARACTERISTICS REPORT INCORPORATING AGRICULTURAL LAND CLASSIFICATION

LAND AT RECTORY FARM, THRAPSTON

1.0 INTRODUCTION

An Agricultural Land Classification Survey was carried out on land at Rectory Farm, Thrapston, by members of the Resource Planning Group. The survey was undertaken in response to an application received by Northamptonshire planning and Transportation Department from Peter Bernie Ltd, for the extraction of sand, gravel and clay, backfilling with spoil and restoration to agricultural use.

The 35 hectare ^{site} lies immediately to the north of the A604, one and a half miles to the east of Thrapston, in Northamptonshire.

A detailed survey on a 100 metre grid, using a hand held auger, was carried out on the site with 37 borings being taken to a maximum depth of 100 cm. In addition, six soil profile pits were dug, so that details of the physical characteristics of the soils could be observed and recorded.

The survey was carried out on the 10th and 11th of October 1989. The site was under continuous arable cropping with linseed grown in the west of the site and field beans in the East. These are grown in rotation with winter wheat and oilseed rape. A limited area of maize was grown on the site as a shelter crop for game birds.

2.0 AGRICULTURAL LAND CLASSIFICATION

2.1 Grade 2 accounts for 5.5 hectares and 15.6% of the site. The soils are typically sandy loams overlying sandy clay loams with either heavy clay loam or sandy loams at depth. Droughtiness is the main limitation to the agricultural use of this land.

2.2 Sub-grade 3a accounts for 29.4 hectares and 83.5% of the site. The soils are typically either heavy clay loams clays overlying calcareous clays. Wetness is the main limitation to the agricultural use of this land.

To the south of Rectory Farm there are small pockets of sub-grade 3b land, where stoniness is the main limitation. However, these areas are too small to map separately at this scale. This area has been disturbed in the past and subsequently restored to agriculture.

3.0 SITE PHYSICAL CHARACTERISTICS

3.1 Climate

This site falls within agro-climatic area 22 east. The site has an average rainfall of 607 mm. Monthly rainfall is

fairly evenly distributed throughout the year, although wettest in August and November. The growing season is 240 days from the end of March to the end of November. The mean last frost is in late April. The moisture deficit for wheat, varies between 112 in the west of the site, and 114 in the east; whilst the moisture deficit for potatoes is 105 and 108 respectively. Field capacity days vary between 122 and 123 days on the site.

3.2 Relief

Altitude varies between 70 m in the west near Elm Lodge and just under 50 m in the east near Rectory Farm. The land is gently undulating and gradient does not represent a limiting factor in the final grading of the land.

4.0 SOIL PHYSICAL CHARACTERISTICS

4.1 Parent Material/Geology

The solid geology of the area is divided into Elsworth Clay and Cornbrash (limestone) in the centre of the site, with Oxford Clay to the east and west. The area is overlain by deposits of sand and gravel.

4.2 Soils

On the western part of the site soils displaying characteristics similar to the Hanslope soil series occur. These chalky till soils are slowly permeable and naturally calcareous.

Over the remainder of the site, soils displaying similar characteristics to the Moreton soil series occur, which are typically clays overlying limestone. In places these soils are shallow and brashy, whilst in others they are deeper with a slowly permeable calcareous clay subsoil, lighter textured sandier soils occur locally within the site.

Five soil units have been identified. These have been separated according to their textures, which reflect these different handling characteristics and storage needs.

A brief description of the 5 soil units is shown on the soil units map. Each soil unit is described in more detail by the relevant soil pit. The following soil pits are representative of the various soil units.

PIT 1	-	Unit 1
PIT 2	-	Unit 2
PIT 3	-	Unit 3
PIT 4	-	Unit 4
PIT 5 & 6	-	Unit 5

5.0. REFERENCES

Geological Survey of England and Wales. Ref. (Solid) East Midlands. 1:250,000 Sheet No. 52⁰N 02⁰W.

Soil Survey of England and Wales.
Soils and Their Uses in Eastern England. Bulletin 13. (1984)

M.A.F.F.
The Agricultural Climate of England and Wales. Technical
Bulletin 435. (1984)

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Agricultural Land Classification of England and Wales.
(Revised Guidelines). (1988)

MINERAL SITE RECORD

SOIL PIT DETAILS

Site Name: Thrapston

Pit Number: 1

Slope: Gentle

Land use: Formerly Linseed

Aspect: Easterly

Depth	Texture	Munsell Colour	Mottles Abundance/ Colour	Structure Grade/Class/Type	Porosity	Stone Abundance/Type	Plant Roots	Comments
0-32	HCL	10 YR 4/3 brown	Few Faint Ochreous Mottles	-	0.5-2%	limestone flint and pebbles ∠ 5% >2cm	Common Fibrous to 30 cm	Very dry and compact. Moderately calcareous.
32-49	C	10YR 4/4 Yellowish brown	Common distinct	Moderately developed medium to coarse angular blocky	<0.5%	Many limestone Fragments		Moderately Calcareous
49-100	C	2.5Y 5/2 greyish brown	Many distinct	Moderately developed coarse angular blocky	<0.5%	"		Strongly calcareous

Profile Details:

Plant roots:

Soil Fauna:

General Comments:

MINERAL SITE RECORD

SOIL PIT DETAILS

Site Name: Thrapston

Pit Number: 2

Slope: level

Land use: Broad bean
Stubble

Aspect:

Depth	Texture	Munsell Colour	Mottles Abundance/ Colour	Structure Grade/Class/Type	Porosity	Stone Abundance/Type	Plant Roots	Comments
0-29	C	10 YR 4/4 Dark yellowish brown	Many Feint Ochreous Mottles	Weakly developed medium sub- angular blocky	> 0.5%	Fragmented limestone 715% locally	Few Fibrous to 30 cm	Moderately calcareous
29-70	C	Orange/grey. 10 YR 5/3 brown (rubbed)	Many distinct	Well developed medium to coarse angular blocky	0.1-0.5%	Many fragmented limestone		Moderately calcareous.
70+	rounded pebbles and clay.							

Profile Details:

Plant roots:

Soil Fauna:

General Comments: On site of old Quarry. Impenetrable below 70 cm.
Soil surface lowered due to quarrying activities

MINERAL SITE RECORD

SOIL PIT DETAILS

Site Name: Thrapston

Pit Number: 3

Slope: Gentle

Land use: Formerly
Broad beans

Aspect: SE

Depth	Texture	Munsell Colour	Mottles Abundance/ Colour	Structure Grade/Class/Type	Porosity	Stone Abundance/Type	Plant Roots	Comments
0-35	SL	10 YR 4/3 Brown/Dark brown	Few Faint Ochreous Mottles	Weakly developed medium to coarse subangular blocky.	0.5-2%	Occasional small rounded pebbles max 2%	Few fibrous (dead) to 35 cm	Straw incor- porated slightly calcareous
35-55	SCL	2.5 Y 5/4 light olive brown	Common Faint ochreous mottles.	Weakly to moderately developed coarse angular blocky	>0.5%	None	None	Slightly calcareous
55-100	HCL	2.5 Y 6/6 Olive yellow + 2.5Y 6/2 light brownish grey	Many distinct ochreous mottles.	Moderately developed very coarse angular blocky.	>0.5%	None	None	Slightly calcareous

Profile Details:

Plant roots:

Soil Fauna: none (occ. beetle)

General Comments:

MINERAL SITE RECORD

SOIL PIT DETAILS

Site Name: Thrapston.

Pit Number: 4

Slope: Gentle

Land use: Formerly Linseed

Aspect: NE

Depth	Texture	Munsell Colour	Mottles Abundance/ Colour	Structure Grade/Class/Type	Porosity	Stone Abundance/Type	Plant Roots	Comments
0-30	SCL	10YR 3/3 Dark brown	Occasional Faint ochreous mottles	-		Occasional limestone Fragments	Common Feint Fibrous	Very slightly calcareous
30-55	SCL	10 YR 4/3 brown/dark brown (rubbed)	Common distinct	Moderately developed medium to coarse sub- angular blocky.	0.5-2%	"	Few Fine Fibrous	Moderately calcareous
55-90	SCL	10YR 4/3 (rubbed) Brown/ Dark brown	Common distinct	Well developed medium to coarse angular blocky	0.5-2%	None	-	Slightly Calcareous
90-140	SL	10 YR 4/3 (rubbed)	-	-	-	None	-	Slightly calcareous

Profile Details:

Plant roots:

Soil Fauna:

General Comments:

MINERAL SITE RECORD

SOIL PIT DETAILS

Site Name: Thrapston

Pit Number: 5

Slope: Gentle

Land use: Broad bean
Stubble

Aspect: N.E.

Depth	Texture	Munsell Colour	Mottles Abundance/ Colour	Structure Grade/Class/Type	Porosity	Stone Abundance/Type	Plant Roots	Comments
0-34	HCL	10 YR 3/2 very dark greyish brown	Few Feint ochreous mottles. Common mgese	-	0.5-2%	Occasional rounded pebbles and limestone fragments.	Few Fine Fibrous	Occasional weathered limestone fragments up to 15 cm slightly calcareous
34-57	HCL/C	2.5Y 4/4 Olive brown	Common Feint Ochreous Mottles.	Weakly developed coarse sub- angular blocky.	< 0.5%	"	-	Very Slightly calcareous
57+	C	2.5Y 5/2 Greyish brown	Many Feint	Well developed coarse angular blocky.	< 0.5%	None.	-	Moderately calcareous

Profile Details:

Plant roots:

Soil Fauna:

General Comments: Calcareous Fragments throughout profile.

MINERAL SITE RECORD

SOIL PIT DETAILS

Site Name: Thrapston

Pit Number: 6

Slope: gentle

Land use: broad bean
Stubble

Aspect: Easterly

Depth	Texture	Munsell Colour	Mottles Abundance/ Colour	Structure Grade/Class/Type	Porosity	Stone Abundance/Type	Plant Roots	Comments
0-33	HCL	10YR 3/3 Dark brown	Common Feint ochreous mottles	-		Occasional rounded pebbles to 5 cm diameter occasional limestone fragments.	Occasional Fine Fibrous dead	Slightly calcareous
33-60	C	2.5 Y 4/4 Olive brown	Many distinct	Weakly developed coarse angular blocky	<0.5%	"	none	Very slightly calcareous
60-90+	C	2.5 Y 5/2 Greyish brown	Many distinct	Moderately developed angular blocky to prismatic	<0.5%	none	none	Very Slightly Calcareous

Profile Details:

Plant roots:

Soil Fauna:

General Comments: Tile drain present at 50 cm.

SOIL NOTES FOR THE PROPOSED SAND AND GRAVEL AND GRAVEL AND CLAY WORKING AT RECTORY FARM, THRAPSTON, NORTHAMPTONSHIRE

1. 0-32 cm brown moderately calcareous clay, 32-60 cm olive brown strongly calcareous clay with a few distinct ochreous mottles, 60-80 cm olive grey clay with common distinct ochreous mottles and limestone fragments, 80 cm + impenetrable. Almost level. Linseed stubble.
 2. 0-30 cm olive brown moderately calcareous clay, 30-66 cm olive strongly calcareous clay with common distinct ochreous mottles, 66-100 cm olive grey strongly calcareous clay with many distinct ochreous mottles and limestone fragments. Very gentle slope. Linseed stubble.
 3. 0-31 cm brown slightly calcareous clay with a few faint ochreous mottles and manganese concretions, 31-75 cm olive brown strongly calcareous clay with common distinct ochreous mottles, 75 cm + impenetrable. Very gentle slope. Linseed stubble.
 4. 0-35 cm brown medium clay loam with a few faint ochreous mottles, 35-80 cm orange brown coarse gritty clay, 80 cm + impenetrable. Very gentle slope. Linseed stubble.
 5. 0-35 cm brown strongly calcareous clay/silty clay, 35-60 cm olive brown strongly calcareous clay with common distinct ochreous mottles and manganese concretions, 60-90 cm olive grey strongly calcareous clay with common distinct ochreous mottles and limestone fragments, 90 cm + impenetrable. Gentle slope. Linseed stubble.
 6. 0-30 cm dark brown medium clay loam, 30-60 cm brown heavy clay loam, 60-75 cm orange brown sandy clay loam, 75-100 cm orange brown sandy loam. Gentle slope. Linseed stubble.
 7. 0-60 cm brown heavy clay loam, 60-70 cm yellow brown sandy clay, very slightly calcareous, with a few distinct ochreous mottles, 70-75 cm yellow sandy loam, 75 cm + yellow brown gritty sand and gravel. Very gentle slope. Linseed stubble.
- NB Limited areas of sand on surface near to boring.
8. Boring moved 20 metres due to pheasant pens. 0-38 cm brown heavy clay loam/clay, 38-84 cm dark olive brown clay with many distinct rusty mottles, 84-100 cm dark grey brown moist gritty heavy sandy clay loam/heavy clay loam. Gentle slope. Linseed stubble.

9. 0-30 cm brown moderately calcareous clay, 30-50 cm olive brown strongly calcareous clay/silty clay with common distinct ochreous mottles, 50-65 cm olive grey clay with common distinct ochreous mottles, strongly calcareous, 65 cm + impenetrable. Gentle slope. Linseed stubble.
10. 0-30 cm brown moderately calcareous clay with a few faint ochreous mottles, 30-60 cm olive grey strongly calcareous clay with limestone fragments, 60 cm + impenetrable. Gentle slope. Linseed stubble.
11. 0-30 cm brown very slightly calcareous clay/heavy clay loam with a few faint ochreous mottles, 30-95 cm + olive brown moderately calcareous clay with a few distinct ochreous mottles. Very gently undulating slope. Linseed stubble.
12. 0-30 cm brown clay, 30-100 cm dark olive brown slightly calcareous clay with a few faint ochreous mottles. Very gentle slope. Linseed stubble.
13. 0-45 cm brown sandy loam/sandy clay loam, 45-60 cm pale grey sandy clay loam with prominent common ochreous mottles, 60-100 cm pale orange grey sandy silt loam. Gentle slope. Broad bean stubble.
14. 0-40 cm brown sandy clay loam/heavy clay loam, 40-70 cm olive brown clay with common distinct ochreous mottles, 70-76 cm olive slightly calcareous clay with common distinct ochreous mottles, 76 cm + impenetrable. Gentle slope. Broad bean stubble.
15. 0-35 cm brown heavy clay loam, 35-57 cm olive brown clay with a few faint ochreous mottles, slightly calcareous, 57-80 cm yellow brown moderately calcareous clay with common distinct ochreous mottles, 80 cm + impenetrable. Gentle slope. Linseed stubble.
16. 0-39 cm brown slightly calcareous heavy clay loam, 39-75 cm olive brown strongly calcareous clay with common distinct ochreous mottles and limestone fragments, 75 cm + impenetrable. Gentle slope. Linseed stubble.
17. 0-34 cm brown slightly calcareous clay, 34-85 cm olive brown very slightly calcareous clay with common distinct ochreous mottles, 85 cm + impenetrable. Gentle slope. Linseed stubble.

18. 0-40 cm brown slightly calcareous heavy clay loam, 40-60 cm olive brown slightly calcareous clay with common distinct ochreous mottles, 60-100 cm olive grey moderately calcareous clay with common distinct ochreous mottles. Almost level. Broad bean stubble.
19. 0-43 cm olive brown very slightly calcareous sandy clay loam, 43-95 cm + yellow brown clay (sandy) with common distinct ochreous mottles becoming sandier with depth. Gentle slope. Broad bean stubble.
20. 0-40 cm olive brown medium clay loam/heavy clay loam with a few faint ochreous mottles, 40-95 cm olive grey clay with many distinct ochreous mottles and occasional coarse sand on ped faces, 95-105 cm grey silty clay with common distinct ochreous mottles. Gentle slope. Broad bean stubble.
21. 0-30 cm brown strongly calcareous heavy clay loam/clay with a few faint ochreous mottles, 30-90 cm olive brown strongly calcareous clay with common distinct ochreous mottles and limestone fragments, 90 cm + impenetrable. Gentle slope. Linseed stubble.
22. 0-40 cm brown moderately calcareous heavy clay loam/clay, 40-60 cm olive brown strongly calcareous clay with common distinct ochreous mottles, 60-65 cm + limestone fragments and clay matrix, 65 cm + impenetrable. Almost level. Bare ground.
23. 0-38 cm brown slightly calcareous clay, 38-50 cm olive brown moderately calcareous clay with common distinct ochreous mottles, 50-80 cm + olive grey strongly calcareous clay. Almost level. Broad bean stubble.
24. 0-48 cm olive brown medium clay loam/sandy clay loam, 48-58 cm orange brown clay with common distinct ochreous mottles, 58-80 cm yellow orange brown clay with coarse sand on ped faces, 80-90 cm + dark orange brown heavy clay loam/coarse sandy clay loam. Gentle slope. Broad bean stubble.
25. 0-40 cm olive brown sandy loam/sandy clay loam, slightly calcareous, 40-90 cm brown heavy clay loam with occasional ochreous mottles. Gentle slope. Broad bean stubble.
26. 0-40 cm olive brown moderately calcareous clay, 40-80 cm orange brown clay with common distinct ochreous mottles and occasional pebbles and occasional manganese concretions, 80-100 cm dark orange brown slightly calcareous clay with many distinct ochreous mottles. Gentle slope. Broad bean stubble.

27. 0-40 cm brown very slightly calcareous heavy clay loam, 40-50 cm orange brown coarse sandy clay loam, 50-100 cm dark orange brown very coarse sandy clay loam/heavy clay loam with common distinct ochreous mottles. Gentle slope. Broad bean stubble.
28. 0-42 cm olive brown very slightly calcareous medium clay loam, 42-60 cm olive sandy clay loam, very slightly calcareous with common faint ochreous mottles, 60-100 cm yellow fine sandy clay loam with common faint ochreous mottles. Gentle slope. Broad bean stubble.
29. 0-40 cm brown heavy clay loam/clay with a few distinct ochreous mottles and very slightly calcareous, 40-50 cm olive brown slightly calcareous clay with common faint ochreous mottles, 50-84 cm olive grey clay with many distinct ochreous mottles, slightly calcareous, 84-94 cm orange brown slightly calcareous clay with many distinct ochreous mottles, and sand on ped faces, 94-110 cm grey silty clay with common prominent ochreous mottles. Gentle slope. Broad bean stubble.
30. 0-43 cm olive brown slightly calcareous heavy clay loam/clay with limestone fragments, 43 cm + impenetrable. Broad bean stubble. Very gentle slope.
31. 0-35 cm brown slightly calcareous clay/silty clay, 35-66 cm olive brown slightly calcareous clay with distinct ochreous mottles, 60-70 cm orange grey slightly calcareous heavy clay loam, 70-110 cm grey silty clay with common distinct ochreous mottles. Almost level. Broad bean stubble.
32. 0-32 cm olive brown moderately calcareous clay with limestone fragments, 32-40 cm olive brown orange strongly calcareous clay loam with a few distinct ochreous mottles. 40 cm + impenetrable. Level. Broad bean stubble. Disturbed.
33. 0-27 cm olive brown strongly calcareous clay, 27-35 cm olive brown strongly calcareous clay with a few distinct ochreous mottles, impenetrable below 35 cm. Fragments of limestone throughout. Level. Broad bean stubble. Disturbed.
34. 0-34 cm olive brown moderately calcareous clay, 34-42 cm olive brown moderately calcareous clay with common distinct ochreous mottles, 42-54 cm orange brown moderately calcareous clay with common distinct ochreous mottles and limestone fragments, 54 cm + impenetrable. Surface fragments of limestone. Level. Ploughed field, Disturbed.

35. Boring moved 10 metres. 0-28 cm olive brown moderately calcareous clay, 28-38 cm orange brown moderately calcareous clay with common distinct ochreous mottles, 38-65 cm orange brown moderately calcareous clay with common distinct ochreous mottles, 65-100 cm grey moderately calcareous silty clay with many prominent ochreous mottles. Level. Large depression. Disturbed.
36. 0-34 cm olive brown clay with a few distinct ochreous mottles, 34-40 cm olive clay with common distinct ochreous mottles, 40-64 cm orange grey clay with common distinct ochreous mottles, 64-100 cm grey and clay/silty clay slightly calcareous. Almost level. Ploughed field.
37. 0-32 cm brown clay moderately calcareous with a few faint ochreous mottles, 32-68 cm olive brown clay with common faint ochreous mottles, moderately calcareous, 68 cm + impenetrable. Level. Ploughed field. Surface fragments of limestone.