Cambridge Waste Water Treatment Plant Relocation Project
Anglian Water Services Limited

Environmental Statement Appendix 6.1: Baseline Agricultural Land Classification

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1 Introduction

1.1 Background

1.1.1 To support the development of the baseline in relation to agricultural land and soils, desktop and field surveys were completed in order to determine the distribution of Agricultural Land Classification (ALC) grades within the area of land required for the Proposed Development.

1.2 Document purpose and scope

1.2.1 This document reports on a soil survey that was undertaken to examine the soil resources and determine the distribution of ALC grades across the proposed WWTP.

1.2.2 This document also reports soil baseline information and provisional ALC grades of Waterbeach Pipeline based on desk study.

1.2.3 The soil properties identified have additionally been used to devise a Soil Management Plan (SMP) for the Proposed Development (Appendix 6.3, App Doc Ref 5.4.6.3) to ensure sustainable soil handling during the construction phase.

1.3 Guidance

1.3.1 The following sets out relevant guidance in relation the ALC.

Natural England Technical Information Note TIN049

1.3.2 This document entitled 'Agricultural Land Classification: protecting the best and most versatile agricultural land' (Natural England, 2009) states that 'where significant development of agricultural land is demonstrated to be necessary, local planning authorities should seek to use areas of poorer quality land in preference to that of higher quality'. It outlines how an ALC provides a method for assessing the quality of farmland to enable informed choices to be made about its future use within the planning system.

Agricultural Land Classification of England and Wales

1.3.3 ALC guidelines provide the industry standard framework for classifying land with respect to developments impacting agricultural land (Ministry of Agriculture, Fisheries and Food, 1998). The following grades describe the cropping potential of land depending on certain physical and chemical properties. Best and most versatile land is classified as grades 1, 2 and 3a.

1.3.4 Grade 1 (excellent quality agricultural land). 'Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality'.

1.3.5 Grade 2 (very good quality agricultural land). 'Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1'.

1.3.6 Grade 3 (good to moderate quality agricultural land). 'Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown, yields are generally lower or more variable than on land in Grades 1 and 2'.

- Subgrade 3a (good quality agricultural land). 'Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops'.
- Subgrade 3b (moderate quality agricultural land). 'Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year'.

1.3.7 Grade 4 (poor quality agricultural land). 'Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land'.

1.3.8 Grade 5 (very poor quality agricultural land). 'Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops'.

1.4 Assumptions and limitations

1.4.1 Soil Resource Surveys (SRS) were scoped out for areas of land temporarily required for the installation of pipelines within the Proposed Development (Waterbeach Pipeline, Final Effluent (FE) and Storm Pipeline and the areas required for the intermediate shafts). This was deemed acceptable due to the temporary nature of the excavation in which the soils would be removed and placed appropriately alongside the trenches (segregating topsoil and subsoils), just prior to installation and reinstated in a timely fashion following installation of the pipelines.

1.4.2 All excavations, transient storage and reinstatement of soils along the pipeline routes will be overseen by a suitably qualified and experienced soil scientist.

2 Baseline information

2.1 Land use and topography

2.1.1 Aerial imagery and preliminary site walkover of land required for the proposed WWTP indicate principle use to be arable cropping.

2.1.2 While undertaking the ALC survey, winter wheat was identified in the fields in the west of the proposed WWTP and oilseed rape and beans in the east.

2.1.3 The land is generally flat with the highest point located within the area of land required for the proposed WWTP. Topography is indicated within Figure 15.4 of Chapter 15.

2.1.4 Aerial imagery indicate that land use in the Waterbeach zone comprises predominantly arable land. This was the area that was not surveyed.

2.2 Geology

2.2.1 Site geology influences soil formation and the various soil types found in specific regions. It should therefore be considered to aid assessment of design options, soil survey requirements, and soil management planning during construction activities. British Geological Survey (BGS) mapping (British Geological Survey, 2021) was consulted to identify superficial and bedrock geology over the survey area prior to an intrusive survey.

Superficial geology

2.2.2 There is no recorded superficial geology for the proposed WWTP, as per the Geology of Britain viewer. However, a strip of peat is recorded within 800m east of the proposed WWTP in the area close to the new outfall. River terrace deposits (sand and gravel sediment) are recorded within 1km south of the proposed WWTP.

2.2.3 Varying superficial deposits are present along the Waterbeach zone, these include River Terrace Deposits, Alluvium and peat deposits.

Bedrock geology

2.2.4 The underlying bedrock for the proposed WWTP is recorded as West Melbury Marly Chalk Formation. This is a buff, grey and off-white, soft, marly chalk and hard grey limestone arranged in couplets.

2.2.5 The West Melbury Marly Chalk Formation comprises the bedrock along the southern section of the Waterbeach zone, with the Gault Formation comprising the bedrock across the reminder of the Waterbeach zone.

2.3 Soil resources

Soil Associations

2.3.1 National soil association mapping (Cranfield University, 2021) suggests that the soils in the area of land required for the Proposed Development comprise ten soil associations, they are described as follows:

- **Adventurers' 1:** Deep peat soils. Flat land. Groundwater levels often controlled by ditches and pumps, some undrained areas. Risk of wind erosion.
- **Clayhythe:** Deep humose fine loamy over sandy and fine loamy over clayey soils mainly calcareous. Some peat soils. Groundwater controlled by ditches and pumps.
- **Evesham 3:** Slowly permeable calcareous clayey, and fine loamy over clayey soils. Some slowly permeable seasonally waterlogged non-calcareous clayey soils.
- **Midelney:** Stoneless clayey soils mostly overlying peat. Soils variably affected by groundwater which is, in places, controlled by ditches and pumps. Flat land. Risk of flooding locally.
- **Milton:** Deep permeable calcareous fine loamy soils variably affected by groundwater. Some similar shallower well drained soils over gravel in places. Complex soil patterns locally.
- **Peacock:** Deep humose calcareous clayey and non-calcareous fine loamy over clayey soils. Some peat soils. Groundwater controlled by ditches and pumps.
- **Reach:** Shallow humose fine loamy calcareous soils over chalk or chalk rubble with groundwater controlled by ditches and pumps.
- **Restored Coprolite:** Restored coprolite workings. Generally slowly permeable seasonally waterlogged calcareous fine loamy over clayey soils. Associated with disturbed calcareous fine loamy and occasional coarse loamy soils.
- **Swaffham Prior:** Well-drained calcareous coarse and fine loamy soils over chalk drift or rubble. Some similar shallow soils. Deep non-calcareous loamy soils in places. Striped and polygonal soil patterns locally.
- **Wantage 2:** Shallow well-drained calcareous silty soils over argillaceous chalk. Sometimes affected by groundwater. Deeper well-drained coarse loamy soils in places. Complex soil patterns locally.

Provisional and previous Agricultural Land Classification

2.3.2 Provisional ALC data (Natural England , 2020) were initially consulted to establish a baseline understanding of the quality of agricultural land likely to be impacted by the Proposed Development. ALC grades are defined in Section 1.3. Section 4 reports the results of the ALC survey subsequent to this baseline study and the results are

mapped in Figure 6.2 Book of Figures – Agricultural Land and Soils (App Doc Ref 5.3.6).

2.3.3 Provisional data from the Magic Map (Department of Environment, Food and Rural Affairs, 2021) application suggests that the land required for the construction of the proposed WWTP and Landscape Masterplan comprises Grade 2 agricultural land. In concurrence, the Natural England map for the 'Likelihood of Best and Most Versatile (BMV) Agricultural Land' (Map Reference: NE170809-1016-779 (Natural England, 2017)) indicates that there is a high likelihood of BMV land on the survey site (i.e. >60% of the area is BMV land).

2.3.4 No previous ALC survey data were available for the area contained within the Scheme Order Limits.

2.4 Climatological data and flooding

2.4.1 Climatological data and flood risk are important physical factors that influence soil resources.

Climatological data

2.4.2 Climate exerts influence on soil formation, soil properties and the agricultural potential of the land. Table 2-1 displays the climatological data for the Proposed Development centered around grid reference TL 495 609 as recorded by the Met Office (Met Office, 2021). Field capacity days are 96, which are low (less than 225) and indicate that the land may not be prone to waterlogging. Average rainfall is lower than the UK average recorded by the Met Office. The accumulated temperature above 0°C (January to June) (AT0) is higher than 1125 day-degrees and can therefore be considered warm enough for sustained cereal production (Hallett & Jones, 1993).

Table 2-1: Climatological data for the area of the Proposed Development

Variable	Measurement
National Grid Reference	TL 495 609
Altitude (m)	8
Average annual rainfall (mm)	570
Lapse rate for average annual rainfall (LAAR) (mm/m)	0.4
Average summer rainfall (April to September) (mm)	300
Accumulated temperature above 0° C (January to June)	1458
Accumulated temperature above 0° C (April to September)	2460
Moisture deficit for winter wheat (mm)	121

Variable	Measurement
Moisture deficit for potatoes (mm)	117
Field capacity days	96

Flood risk

2.4.3 The Environment Agency's Flood Map for Planning (Environment Agency, 2021) was used to identify flood zones. Flood risk is relevant because soils function as water stores for flood attenuation. The requirement for contractors to monitor and manage flood risk may affect soil resources during construction. Flood zones were reported with the following designations:

- Flood Zone 1 – less than 1 in 1,000 annual probability of river flooding.
- Flood Zone 2 – between a 1 in 100 and 1 in 1,000 annual probability of river flooding.
- Flood Zone 3 – 1 in 100 or greater annual probability of river flooding.

2.4.4 The area of land required for the construction of the proposed WWTP (including FE and Storm Pipeline and Outfall) and Landscape Masterplan is located in flood zone 1 (less than 1 in 1,000 annual probability of river flooding) and Flood Zone 2 (1 in 100 and 1 in 1,000 annual probability of river flooding).

2.4.5 The area of land temporarily required for the construction of the northern extent of the Waterbeach pipeline (up to 1.6km) is within Flood Zone 2.

2.4.6 Further assessment on flood risk has been completed and reported within the Flood Risk Assessment (FRA) (Application Document Reference 5.4.20.1)

3 Survey methodology

3.1 Survey locations

3.1.1 An ALC survey was undertaken on an area of approximately 100ha in the area of land required for the proposed WWTP and landscape masterplan, to the north of the A14 between Fen Ditton and Horningsea (Figure 6.3 Book of Figures- Agricultural Land and Soils (App Doc Ref 5.3.6)). Ten fields were surveyed, and labelled G036-1, G036-10, R037-1, R037-2, R037-3, R037-4, R037-5, Y039-1, Y039-2 and Y039-4 (Figure 6.3 Book of Figures- Agricultural Land and Soils (App Doc Ref 5.3.6)).

3.2 Survey approach

3.2.1 An ALC survey was undertaken in accordance with the 'Agricultural Land Classification of England and Wales' (Ministry of Agriculture, Fisheries and Food, 1998) and the Soil Survey Handbook (Hodgson, 1997), to determine the distribution of agricultural land grades across the survey locations.

3.2.2 The survey was undertaken between 22nd and 26th November 2021 by suitably qualified soil scientists.

3.2.3 Edelman (Dutch) hand augers were used to take cores to a depth of 120cm or bedrock, whichever was shallower. The cores were distributed across the survey site in a grid formation every 100m, satisfying and exceeding the requirement for 1 auger bore per hectare (Figure 6.3 Book of Figures- Agricultural Land and Soils (App Doc Ref 5.3.6)).

3.2.4 The auger points were positioned using a handheld GPS with a pre-loaded survey boundary and auger bore locations.

3.2.5 Two soil pits were also included to further examine the soil profile and structure. To avoid buried services, Cable Avoidance Tool and Generator (CAT and Genny) equipment was used to scan auger locations and a buried service plan was consulted.

3.2.6 The ALC survey comprised an assessment for soil horizon depth, texture, mottling, stoniness, structure, ped strength, carbonate content, slope and presence of roots. Soil calcareousness was determined by the addition of hydrochloric acid (10%). Soil colour was classified according to a Munsell Soil Colour Chart (Munsell, 2010).

3.2.7 Sampling of topsoil and subsoil was additionally carried out for laboratory analysis of nutrient concentrations and organic matter content.

3.2.8 Soil sampling was undertaken in accordance with the guidelines outlined in Natural England Technical Information Note TIN035 (Natural England, 2008). Samples were taken from each field and placed in clean polythene bags. These comprised 25 cores bulked together to give a composite sample (500 g). A gouge auger was used to take the 25 topsoil cores (to a depth of ~25cm) and the 25 subsoil cores (~25 – 50cm), distributed in a W pattern across the field.

3.3 Analysis

3.3.1 The soil samples were tested by NRM Laboratories (UK) for pH, available phosphorus (P), potassium (K) and magnesium (Mg), and organic matter. The results were interpreted as per Natural England TIN036 (Natural England, 2008), and British Standard's topsoil specification (British Standards Institution, 2015) and subsoil specification (British Standards Institution, 2013).

3.3.2 The laboratory analysis records are located within Appendix A.3.

4 Survey results

4.1 Soil resources

Main soil types

4.1.1 The soils are generally well drained, calcareous soils with few to common flints at various depths. Three major soil types were identified in the survey (Figure 6.4 Book of Figures – Agricultural Land and Soils (App Doc Ref 5.3.6)). Soil type 1 is shallow, very calcareous loam over chalk, chalk rubble or chalk drift (Figure 4.1). Soil type 2 is very calcareous deep loam (Figure 4.2). Soil type 3 is very calcareous deep soil with loam over loamy sand or sand (Figure 4.3). The soils over the proposed WWTP vary within distance. Figure 4.4 indicates the frequent variation and complex pattern of the soils. Detailed auger borehole data are in Appendices A.1 and A.2.

Figure 4.1: Soil Type 1 – Shallow calcareous loam
Source: Mott MacDonald, November 2021

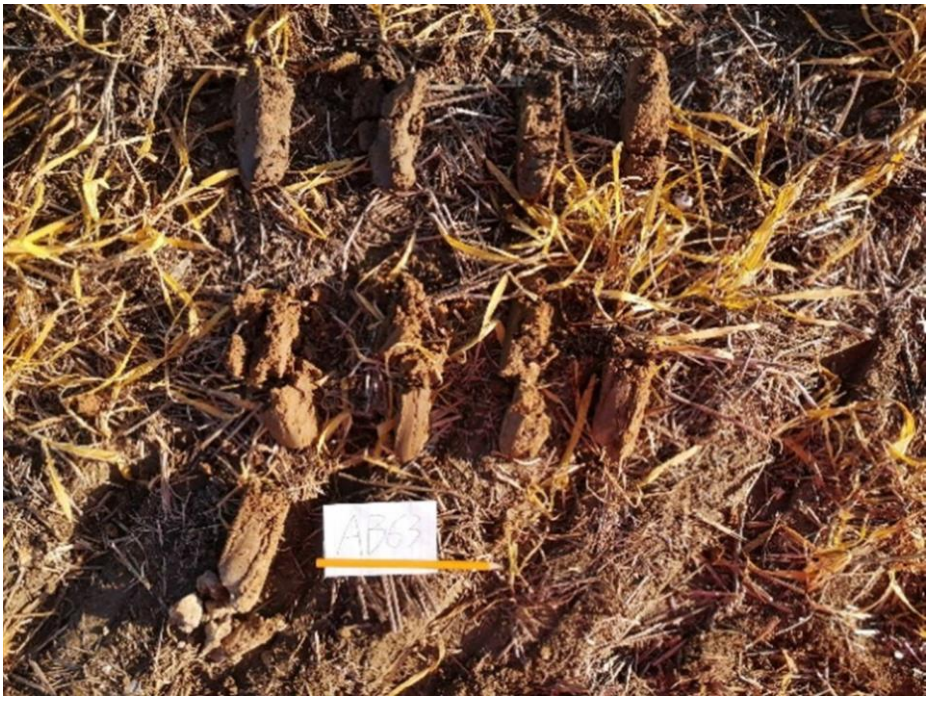

Figure 4.2: Soil Type 2 – Deep calcareous loam
Source: Mott MacDonald, November 2021

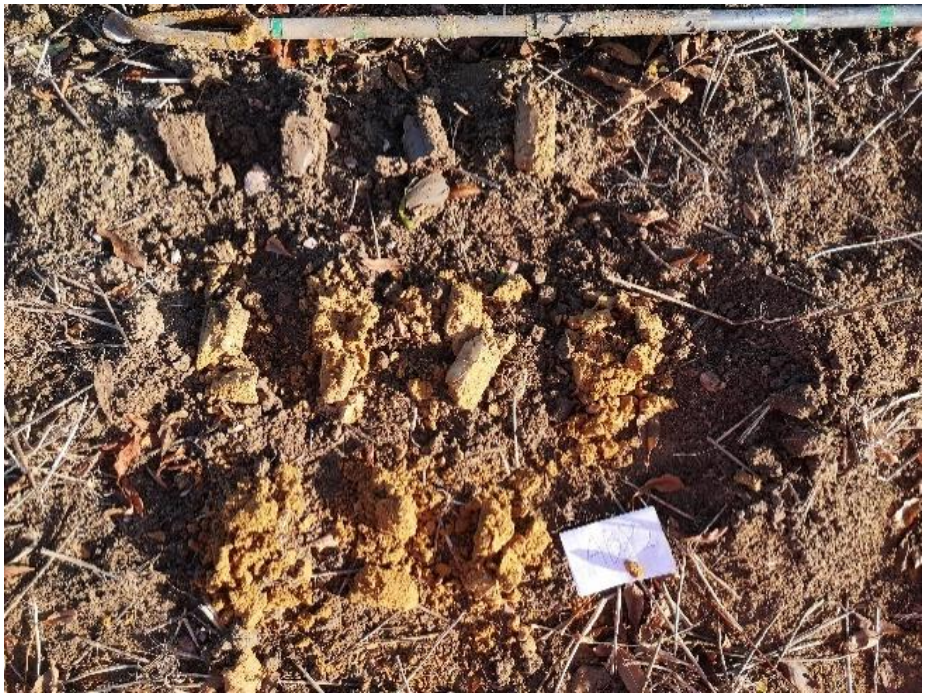

Figure 4.3*:* Soil Type 3 – Calcareous loam over loamy sand or sand
Source: Mott MacDonald, November 2021

Figure 4.4: Soil pattern
Source: Mott MacDonald, November 2021

Soil nutrients

4.1.2 The results of laboratory soil nutrient analyses are displayed in Table 4-1 (and attached in Appendix A.3) and interpreted following Natural England TIN036 (Natural England, 2008) and British Standard specifications (British Standards Institution, 2015) and (British Standards Institution, 2013). Most soils are classified as low fertility calcareous soils as per British Standard specifications (British Standards Institution, 2015) and (British Standards Institution, 2013) for soils with <5% soil organic matter, <20mg P/L, >20% clay, and a pH>7. The distribution of specific nutrients phosphorous (P), potassium (K) and Magnesium (Mg) is shown in Figures 6.5 – 6.10 Book of Figures – Agricultural Land and Soils (App Doc Ref 5.3.6). The results are summarised below:

- Topsoil P levels are mostly low, with one field having very low levels and two fields having moderate levels.
- Most subsoil P levels are very low, with two fields having low levels.
- Topsoil K levels are mostly moderate, whilst subsoil levels are mostly low.
- Topsoil Mg levels range from low to moderate, whilst subsoil Mg is low. The low nutrient levels and fertility of the soils within the land required for the proposed WWTP and landscape masterplan is ideal for the establishment of biodiverse habitats, which are commonly associated with low available P levels.
- Field R037-2 is an exception with moderate P levels and is therefore categorised as multipurpose soil, which may not be suitable for biodiverse habitats.

Table 4-1*:* Soil nutrient levels

Field	Soil Layer	pH	Organic matter (LOI %)	Phosphorous (mg/L)	Potassium (mg/L)	Magnesium (mg/L)	Description
G036-10	Topsoil	8.2	3.6	10.8 (L)*	126 (M)	35 (L)	Low fertility calcareous soil
	Subsoil	8.2	3.4	8.6 (VL)*	118 (L)	35 (L)	
G036-1	Topsoil	8.1	4.8	11.2 (L)*	81 (L)	38 (L)	
	Subsoil	8.4	3.0	7.0 (VL)*	48 (L)	26 (L)	
R037-1	Topsoil	8	3.3	13.6 (L)*	137 (M)	41 (L)	
	Subsoil	8.1	2.7	7.4 (VL)*	112 (L)	34 (L)	
R037-2	Topsoil	8.2	3.1	20.8 (M)*	156 (M)	43 (L)	Multipurpose soil
	Subsoil	8.3	2.6	6.4 (VL)*	77 (L)	37 (L)	Low fertility calcareous soil
R037-3	Topsoil	8	3.6	12 (L)*	149 (M)	52 (M)	
	Subsoil	7.7	2.8	7.4 (VL)*	113 (L)	43 (L)	
R037-4	Topsoil	8	3.3	11 (L)*	149 (M)	54 (M)	
	Subsoil	8.2	3	9.8 (L)*	132 (M)	49 (L)	
R037-5	Topsoil	8.2	3.1	19.8 (M)*	205 (M)	44 (L)	
	Subsoil	8.4	2.6	9.6 (L)*	145 (M)	38 (L)	
Y039-2	Topsoil	8	3.8	8.4 (VL)*	134 (M)	42 (L)	
	Subsoil	7.7	3.5	6.6 (VL)*	92 (L)	40 (L)	
Y039-4	Topsoil	8	5.7	13.8 (L)*	120 (L)	46 (L)	
	Subsoil	8.1	4.9	9.4 (VL)*	96 (L)	43 (L)	
YO39-1	Topsoil	7.5	3.9	13 (L)*	140 (M)	51 (M)	
	Subsoil	7.3	3.4	8 (VL)*	106 (L)	50 (L)	

**VL, Very Low; L, Low; M, Moderate as classified by Natural England TIN036*

Soil volumes

4.1.3 This section reports on soil volume sin relation to the area of land subject to soil resource survey.

4.1.4 Table 4-2 summarises the average thickness of topsoil and subsoils for each field within the area surveyed and provides an estimate of approximate soil volumes likely to be generated by soil stripping (rounded to the nearest 100 m^3). The thickness of each horizon was estimated from the soil texture descriptions of each borehole as per Appendices A.1 and A.2 and reported in Table 4-2 and Figure 6.4 Book of Figures – Agricultural Land and Soils (App Doc Ref 5.3.6).

Table 4-2: Soil thickness and approximate volumes per soil type and field

Soil type	Horizon thickness (cm)			Field	Area (m^2)	Approximate volume (m^3)		
	Topsoil	Upper subsoil	Lower subsoil			Topsoil	Upper subsoil	Lower subsoil
Soil type 1	28	21	24	R037-1	49,000	13,700	10,300	11,800
				R037-3	13,000	3,600	2,700	3,000
				R037-4	79,000	22,100	16,600	19,000
				Y039-1	14,000	4,000	2,900	3,400
				Y039-4	7,700	2,200	1,600	1,800
				Total	**162,700**	**45,600**	**34,200**	**39,000**
Soil type 2	27	22	48	G036-10	18,000	4900	4,000	8,600
				R037-1	68,500	18,500	15,000	32,900
				R037-2	105,000	28,400	23,100	50,500
				R037-3	72,500	19,600	16,000	34,800
				R037-4	63,000	17,000	13,900	30,200
				Y039-1	31,000	8,400	6,800	14,900
				Y039-2	45,000	12,200	9,900	21,600
				Y039-4	8,300	2,200	1,800	4,000
				Total	**411,300**	**111,000**	**90,500**	**197,400**
Soil type 3	27	25	47	G036-2	6,500	1,800	1,600	3,000
				G036-10	6,200	1,700	1,500	2,900
				R037-1	2,000	500	500	940
				R037-2	120,000	32,400	30,000	56,400
				R037-3	73,000	19,700	18,300	34,300
				R037-4	35,000	9,500	8,800	16,500
				Y039-1	20,000	5,400	5,000	9,400
				Y039-2	49,200	13,300	12,300	23,100
				Total	**311,300**	**84,200**	**78,000**	**146,600**

4.2 Agricultural Land Classification

Climatic limitations

4.2.1 Climate does not pose a significant limiting factor on crop production, as demonstrated by the accumulated temperature of 2460°C above 0°C and 570mm of average annual rainfall on the Proposed Development (Met Office 2021). Therefore, the land is considered Grade 1 for climatic limitation.

Gradient and microrelief

4.2.2 The site gradient is generally level between 0 – 1 degrees with only a few very gentle slopes in fields R037-5, R037-4 and Y039-1. As such, gradient and microrelief are not considered to represent limiting factors.

Flooding

4.2.3 The study area is located within Environment Agency Flood Zones 1, 2 and 3 (Appendix 20.1, App Doc Ref 5.4.20.1: Flood Risk Assessment). Fluvial flood risk associated with flood zones can be summarised as follows:

- Flood Zone 1 has a less than 1 in 1,000 year (0.1%) annual probability of river flooding;
- Flood Zone 2 has a 1 in 1,000 year to 1 in 100 year (0.1% to 1%) annual probability of river flooding; and
- Flood Zone 3 has a greater than 1 in 100 year (1%) annual probability of river flooding.

4.2.4 The proposed WWTP is located within Flood Zone 1 (low risk of fluvial flooding). The Proposed Development includes below-ground pipelines and a tunnel linking existing and proposed infrastructure, some elements of which are located within Flood Zones 2 and 3 (medium to high risk of fluvial flooding).

4.2.5 This does not represent a site limitation in relation to soil resource management.

Soil texture and structure

4.2.6 As stated in Section 4.1 and soil textures in soil profile characteristics Appendix A.1, the soils within the land required for the proposed WWTP generally comprise very calcareous loamy topsoils with few to common hard stones over either loamy subsoils, greyish chalk, chalk rubble, or occasionally loamy sand or sand.

4.2.7 In relation to the areas where soil survey has been completed the soils are well drained with few mottles in lower subsoils or chalk and have a moderate structure overall. No slowly permeable layers were observed in soil profiles. This indicates that in general, there is no soil texture and structure limitation.

Soil depth and stoniness

4.2.8 Soil depth within the area of land surveyed generally reaches 1.2m, or around 39 – 115cm when the soils occur over chalk or chalk rubble. The flints and pebbles from topsoils are lightly or very lightly stony. These give a depth Grade of 1 – 3a, and a stoniness Grade of 1 – 2, but these Grades are overridden by other Grades of other factors.

Chemical limitations

4.2.9 No evidence of long-term agricultural limitations caused by soil chemical properties was observed within the area of land subject to survey. As such, there are no chemical limitations considered to impact the ALC Grade assigned to the area of land required for the proposed WWTP and landscape masterplan.

Erosion

4.2.10 No evidence of soil erosion was observed during the survey, and therefore erosion is not considered an agricultural limitation in this location.

Interactive limitations

4.2.11 Soil wetness and droughtiness were assessed to examine limitations from climate, site and soils data collected during the ALC survey for each auger borehole. These are included within Appendix A.1. The calculation indicates that the wetness Grades of the soils is 1 and 2, and droughtiness is Grades 2, 3a and 3b (Figure 6.2 Book of Figures – Agricultural Land and Soils (App Doc Ref 5.3.6).

ALC Grades

4.2.12 Assessment of all limiting factors discussed in Section 0 confirmed soil droughtiness (Interactive Limitations), to be the most common deciding factor within the surveyed area.

4.2.13 The ALC of the area of land required for the proposed WWTP and landscape masterplan falls under Grades 2, 3a and 3b. (Figure 6.2 Book of Figures – Agricultural Land and Soils (App Doc Ref 5.3.6)

5 Conclusion

5.1.1 The area and distribution of overall ALC Grades in the surveyed area (100 ha) are displayed in Figure 6.2 Book of Figures – Agricultural Land and Soils (App Doc Ref 5.3.6) and are summarised as follows:

- Grade 2 (very good quality agricultural land): 30 ha, 30% of the surveyed area of the area of land required for the proposed WWTP;
- Grade 3a (good to moderate quality agricultural land): 50 ha, 50% of the surveyed area of the area of land required for the proposed WWTP; and
- Grade 3b (moderate quality agricultural land): 20 ha, 20% of the surveyed area of the area of land required for the proposed WWTP.

5.1.2 For agricultural land not subjected to the ALC survey, it has been classified as follows (based on provisional ALC grades):

- Grade 1 (excellent quality agricultural land);
- Grade 2 (very good quality agricultural land);
- Grade 3 (good to moderate quality agricultural land); and
- Grade 4 (poor quality agricultural land).

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Appendices

Appendix A.1 – Auger borehole Soil Profile Characteristics

Auger Borehole	Horizon (cm)	Texture	Soil Matrix Colour	Mottling*	Gleyed horizon	Slowly permeable layer	CaCo3 %	Stone content			Organic Matter %	Wetness Grade	Drought Grade (Wheat)	Drought Grade (Potato)	Overall ALC Grade
								>2cm	>6cm	Type					
AB 1	0 – 27	hCL	7.5YR3/4	None	N	N	>10%	3%	1%	Hard stone	4 – 5	2	3b	3a	3b
	27 – 58	hCL	7.5YR3/4	None	N	N	>10%	1%		Hard stone					
AB 2	0 – 26	hCL	7.5YR3/4	None	N	N	>10%	4%		Hard stone	3	2	3b	3b	3b
	26 – 48	hCL	7.5YR3/4	None	N	N	>10%	1%		Hard stone					
AB 3	0 – 27	hCL	7.5YR3/4	None	N	N	>10%	5%		Hard stone	5	2	3b	3a	3b
	27 – 58	hCL	7.5YR3/4	None	N	N	>10%	2%		Hard stone					
AB 4	0 – 28	hCL	10YR4/2	None	N	N	>10%	2%		Hard stone		2	3a	3a	3a
	28 – 55	hCL	10YR5/2	Few	Y	N (very firm medium subangular blocky structure)	>10%	2%		Flint					
	55 – 80	hCL	10YR7/0	Few	Y	N (very firm medium subangular blocky structure)	>10%	80%		Chalk					
AB 5	0 – 26	hCL	10YR4/3	None	N		>10%	5%		Flint		2	2	3a	3a
	26 – 53	hCL	10YR5/3	Few	Y	N (very firm medium subangular blocky structure)	>10%	8%		Flint					
	53 – 76	hCL	10YR7/0	Few	Y	N (very firm medium subangular blocky structure)	>10%	80%		Chalk					
	76 – 120	mSL	10YR7/0	Common	Y	N (weakly developed structure)	>10%	95%		Chalk					

AB 6	0 – 25	SCL	7.5YR3/4	None	N	N	>10%	5%	1%	Hard stone	4 – 5	1	3a	3a	3a
	25 – 48	SCL	7.5YR3/4	None	N	N	>10%	2%		Hard stone					
	48 – 75	SCL	7.5YR6/4	None	N	N	>10%	2%		Hard stone					
AB 7	0 – 26	mCL	7.5YR3/4	None	N	N	>10%	9%	1%	Hard stone	5	1	3b	3b	3b
	26 – 48	mCL	7.5YR3/4	None	N	N	>10%	2%		Hard stone					
AB 8	0 – 29	hCL	7.5YR3/4	None	N	N	>10%	4%	3%	Hard stone	5	2	3b	3b	3b
	29 – 45	hCL	7.5YR7/6	None	N	N	>10%	3%		Hard stone					
AB 9	0 – 32	mCL	7.5YR3/4	None	N	N	>10%	6%	3%	Hard stone	5	1	3b	2	3b
	32 – 70	SCL	7.5YR7/6	None	N	N	>10%	3%		Hard stone					
	70+			None	N	N	>10%	3%		Hard stone					
AB 10	0 – 28	hCL	7.5YR4/3	None	N	N	>10%	5%	1%	Hard stone	5	2	3b	3b	3b
	28 – 45	hCL	7.5YR4/3	None	N	N	>10%	5%		Hard stone					
	45+		2.5YR7/1	None	N	N	>10%			Hard stone					
AB 11	0 – 26	mCL	10YR4/3	None	N	N	>10%	5%		Flint		1	3a	3a	3a
	26 – 67	hCL	10YR5/3	Few	Y	N (very firm medium subangular blocky structure)	>10%	8%		Flint					
	67 – 88	hCL	10YR7/0	None	N	N	>10%	90%		Chalk					
AB 12	0 – 24	mCL	10YR4/3	None	N	N	>10%	3%		Flint		1	3a	3a	3a
	24 – 50	hCL	10YR5/3	Few	Y	N (very firm medium subangular blocky structure)	>10%	8%		Flint					
	50 – 88	hCL	10YR7/0	None	N	N	>10%	70%		Chalk					
AB 13	0 – 26	mCL	7.5YR3/4	None	N	N	>10%	4%		Hard stone	5	1	2	2	2
	26 – 40	mCL	7.5YR3/4	None	N	N	>10%	2%		Hard stone					
	40 – 70	SCL	7.5YR4/3	None	N	N	>10%	2%		Hard stone					
	70 – 120	SCL	7.5YR6/4	None	N	N	>10%	2%		Hard stone					

AB 14	0 – 28	mCL	7.5YR3/4	None	N	N	>10%	5%	1%	Hard stone	5	1	2	2	2
	28 – 40	mCL	7.5YR3/4	None	N	N	>10%	2%		Hard stone					
	40 – 120	mCL	7.5YR7/6	None	N	N	>10%	2%		Hard stone					
AB 15	0 – 25	mCL	7.5YR3/4	None	N	N	>10%	4%	1%	Hard stone	5	1	2	3a	3a
	25 – 42	mCL	7.5YR3/4	None	N	N	>10%	1%		Hard stone					
	42 – 120	SCL	7.5YR7/8	None	N	N	>10%	25%	10%	Hard/soft					
AB 16	0 – 26	mCL	7.5YR3/4	None	N	N	>10%	6%	3%	Hard stone	5	1	3a	2	3a
	26 – 40	mCL	7.5YR3/4	None	N	N	>10%	5%		Hard stone					
	40 – 75	SCL	7.5YR4/3	None	N	N	>10%	5%		Hard stone					
	75 – 100	SCL	7.5YR7/8	None	N	N	>10%	5%		Hard stone					
AB 17	0 – 30	mCL	7.5YR2.5/2	None	N	N	>10%	4%	1%	Hard stone	8	1	2	2	2
	30 – 60	hCL	7.5YR6/4	None	N	N	>10%	5%		Hard stone					
	60 – 120	hCL	7.5YR7/8	None	N	N	>10%	5%		Hard stone					
AB 18	0 – 25	hCL	7.5YR3/4	None	N	N	>10%	5%	1%	Hard stone	5	2	3b	3a	3b
	25 – 35	hCL	7.5YR3/4	None	N	N	>10%	3%		Hard stone					
	35 – 65	hCL	7.5YR4/3	None	N	N	>10%	3%		Hard stone					
AB 19	0 – 25	hCL	7.5YR4/3	None	N	N	>10%	4%	1%	Hard stone	4	2	3b	3b	3b
	25 – 45	hCL	7.5YR4/3	None	N	N	>10%	1%		Hard stone					
	45+		2.5YR7/1	Few	Y	N (very firm medium subangular blocky structure)	>10%			Hard stone					
AB 20	0 – 30	hCL	7.5YR3/4	None	N	N	>10%	6%		Hard stone	5	2	3b	3a	3b
	30 – 65	hCL	7.5YR3/4	None	N	N	>10%	2%		Hard stone					
	65+		2.5YR7/1	None	N	N	>10%	3%		Hard stone					
AB 21	0 – 29	hCL	7.5YR4/3	None	N	N	>10%	6%	1%	Flint		2	3b	3a	3b
	29 – 55	hCL	7.5YR4/3	None	N	N	>10%	2%		Flint					
	55+		2.5YR7/1	None	N	N	>10%	2%		Flint					

AB 22	0 – 28	mCL	10YR4/2	None	N	N	>10%	6%		Flint		1	3a	3a	3a
	28 – 52	hCL	10YR5/3	None	N	N	>10%	8%		Flint					
	52 – 68	hCL	10YR7/0	None	N	N	>10%	70%		Chalk					
	68 – 90	SL	10YR7/0	None	N	N	>10%	80%		Chalk					
AB23	0 – 34	mCL	7.5YR3/3	None	N	N	>10%	6%		Flint	5	1	2	3a	3a
	34 – 58	mCL	7.5YR3/4	None	N	N	>10%			Flint					
	58 – 107	SL	10YR7/0	None	N	N	>10%			Flint					
	107+			None	N	N	>10%			Flint					
AB 24	0 – 28	mCL	7.5YR3/4	None	N	N	>10%	4%	2%	Hard stone	5	1	3b	2	3b
	28 – 45	mCL	7.5YR3/4	None	N	N	>10%	4%		Hard stone					
	45 – 68	mCL	7.5YR4/3	None	N	N	>10%	4%		Hard stone					
AB 25	0 – 30	mCL	7.5YR3/4	None	N	N	>10%	5%	2%	Hard stone	5	1	3a	2	3a
	30 – 52	SCL	7.5YR4/3	None	N	N	>10%	2%		Hard stone					
	52 – 75	mSL	7.5YR4/3	None	N	N	>10%	2%		Hard stone					
AB 26	0 – 30	hCL	7.5YR3/4	None	N	N	>10%	6%	3%	Hard stone	5	2	2	2	2
	30 – 80	hCL	7.5YR4/3	None	N	N	>10%	3%		Hard stone					
	80 – 110	mCL	7.5YR7/8	None	N	N	>10%	3%		Hard stone					
AB 27	0 – 29	hCL	7.5YR3/4	None	N	N	>10%	9%	2%	Hard stone	5	2	3a	2	3a
	29 – 42	hCL	7.5YR4/3	None	N	N	>10%	5%		Hard/soft stone					
	42 – 75	hCL	7.5YR7/8	Few	Y	N (very firm medium subangular blocky structure)	>10%	2%		Hard/soft stone					
AB 28	0 – 30	hCL	7.5YR3/4	None	N	N	>10%	3%	2%	Hard stone	5	2	2	2	2
	30 – 65	hCL	7.5YR4/3	None	N	N	>10%	3%		Hard stone					
	65 – 120	SCL	7.5YR7/8	None	N	N	>10%	3%		Hard stone					
AB 29	0 – 30	hCL	7.5YR2.5/3	None	N	N	>10%	5%	2%	Hard stone	7 – 8	2	2	3a	3a
	30 – 40	hCL	7.5YR2.5/3	None	N	N	>10%	2%		Hard stone					

	40 – 75	hCL	7.5YR4/3	None	N	N	>10%	2%		Hard stone					
	75 – 120	hCL	7.5YR4/3	None	N	N	>10%	30%		Hard stone					
AB 30	0 – 27	hCL	7.5YR3/4	None	N	N	>10%	6%	1%	Hard stone	6	2	3a	2	3a
	27 – 42	hCL	7.5YR3/4	None	N	N	>10%	2%		Hard stone					
	42 – 75	hCL	7.5YR4/3	None	N	N	>10%	3%		Hard stone					
AB 31	0 – 27	hCL	7.5YR3/2	None	N	N	>10%	6%	1%	Flint	4 – 5	2	3a	2	3a
	27 – 80	hCL	7.5YR4/2	None	N	N	>10%	6%		Hard/soft					
	80+		2.5YR7/1	Few	Y	N (>80cm depth)	>10%	6%		Hard/soft					
AB 32 (Pit 1)**	0 – 27	SCL	7.5YR3/2	None	N	N	>10%	6%	1%	Flint	4 – 5	2	3a	3a	3a
	27 – 78	SCL	7.5YR4/2	None	N	N	>10%	5%	5%	Hard/soft					
	78+		2.5YR7/1	Few	Y	N (<15cm thickness within 80cm of surface)	>10%	5%	5%	Hard/soft					
AB 33	0 – 30	hCL	7.5YR4/3	None	N	N	>10%	4%	1%	Hard stone	4	2	3a	2	3a
	30 – 120	hCL	7.5YR7/1	Few	Y	N (very firm medium subangular blocky structure)	>10%	30%		Chalk					
AB 34	0 – 28	mCL	10YR4/2	None	N	N	>10%	6%		Flint		1	3a	3a	3a
	28 – 56	hCL	10YR4/3	None	N	N	>10%	8%		Flint					
	56 – 85	hCL	2.5Y8/3	Few	Y	N (very firm medium subangular blocky structure)	>10%	75%		Chalk					
AB 35	0 – 30	mCL	7.5YR3/2	None	N	N	>10%	6%		Flint		1	3a	2	3a
	30 – 47	mSCL	7.5YR4/3	Few	Y	N	>10%								
	47 – 87	mSL	7.5YR4/4	None	N	N	>10%								
	87 – 120		7.5YR6/1	Few	Y	N (>80cm depth)	>10%								
AB 36	0 – 26	mCL	10YR4/2	None	N	N	>10%	5%		Flint		1	2	3a	3a

	26 – 55	SCL	10YR4/4	Few	N	N	>10%	20%		Flint					
	55 – 82	SCL	10YR7/0	Few	Y	N (firm subangular blocky structure)	>10%	70%		Chalk					
	82 – 120	mSL	7.5YR5/6	None	N	N	>10%	10% +10%		Flint + Chalk					
AB 37	0 – 29	mCL	7.5YR3/4	None	N	N	>10%	6%	2%	Hard stone	4 – 5	1	3b	3b	3b
	29 – 48	mCL	7.5YR3/4	None	N	N	>10%	1%		Hard stone					
	48 – 68	hZCL	7.5YR7/1	Few	Y	N (firm subangular blocky structure)	>10%	2%		Hard stone					
	68+		2.5YR7/1	Few	Y	N (firm subangular blocky structure)	>10%	2%		Hard stone					
AB 38	0 – 28	mCL	10YR4/3	None	N	N	>10%	3%		Flint		1	3a	3a	3a
	28 – 62	SCL	10YR5/3	Few	Y	N (firm subangular blocky structure)	>10%	20%		Flint					
	62 – 82	SCL	10YR5/4	Few	N	N	>10%	30% + 10%		Flint /Chalk					
AB 39	0 – 23	mCL	10YR4/2	None	N	N	>10%	3%		Flint		1	3a	3a	3a
	23 – 46	SCL	7.5YR5/6	Few	N	N	>10%	8%		Flint					
	46 – 92	SCL	10YR7/0	None	N	N	>10%	75%		Chalk					
AB 40	0 – 25	mCL	10YR4/2	None	N	N	>10%	7%		Flint		1	3a	3a	3a
	25 – 50	SCL	10YR4/3	None	N	N	>10%	8%		Flint					
	50 – 68	SCL	10YR7/0	Few	Y	N (firm subangular blocky structure)	>10%	70%		Chalk					
	68 – 90	SCL	10YR7/0	None	N	N	>10%	80%		Chalk					
AB 41	0 – 25	mCL	10YR3/2	None	N	N	>10%	3%		Flint		1	3a	3a	3a
	25 – 45	SCL	10YR5/3	None	N	N	>10%	8%		Flint					

	45 – 72	SCL	10YR7/0	Common	Y	N (firm subangular blocky structure)	>10%	20%		Flint					
	72 – 120	mS	10YR7/8	None	N	N	>10%	40%		Flint					
AB 42	0 – 30	hCL	7.5YR2.5/3	None	N	N	>10%	3%	3%	Hard stone	6 – 7	2	2	2	2
	30 – 60	hCL	7.5YR3/4	None	N	N	>10%	5%		Hard stone					
	60 – 85	hCL	7.5YR4/3	None	N	N	>10%	5%		Hard stone					
	85 – 115	mCL	7.5YR7/8	Few	N	N	>10%	5%		Hard stone					
AB 43	0 – 29	mCL	7.5YR3/4	None	N	N	>10%	5%		Hard stone	4	1	3b	3a	3b
	29 – 39	mCL	7.5YR5/3	None	N	N	>10%	2%							
	39+		2.5YR7/1	None	N	N	>10%								
AB 44	0 – 27	SCL	10YR4/2	None	N	N	>10%	5%		Flint		1	3b	3a	3b
	27 – 62	SCL	10YR4/3	None	N	N	>10%	20%		Flint					
AB 45	0 – 26	SCL	10YR4/2	None	N	N	>10%	7%		Flint		1	3a	3a	3a
	26 – 50	SCL	10YR4/3	None	N	N	>10%	8%		Flint					
	50 – 65	SCL	10YR7/0	None	N	N	>10%	70%		Chalk					
	65 – 96	mSL	10YR7/0	None	N	N	>10%	70%		Chalk					
AB 46	0 – 26	mCL	10YR4/2	None	N	N	>10%	5%		Flint		1	3a	3a	3a
	26 – 55	SCL	10YR5/4	Few	N	N	>10%	8%		Flint					
	55 – 88	SCL	10YR4/5	Few	N	N	>10%	20%		Flint					
AB 47	0 – 28	mCL	7.5YR3/4	None	N	N	>10%	6%	1%	Hard stone	4 – 5	1	2	2	2
	28 – 48	mCL	7.5YR3/4	None	N	N	>10%	1%	1%	Hard stone					
	48 – 88	mSL	10YR7/8	None	N	N	>10%	1%		Hard stone					
	88 – 120	SCL	7.5YR7/1	Few	Y	N (firm subangular blocky structure)	>10%	1%		Hard stone					
AB 48	0 – 28	mCL	10YR4/2	None	N	N	>10%	3%		Flint		1	2	3a	3a
	28 – 48	SCL	7.5YR5/6	None	N	N	>10%	8%		Flint					

	48 – 80	SCL	10YR7/0	Few	Y	N	>10%	60%		Chalk					
	80 – 120	SCL	10YR7/0	None	N	N	>10%	80%		Chalk					
AB 49	0 – 27	SCL	10YR4/2	None	N	N	>10%	5%		Flint		1	3a	3a	3a
	27 – 48	SCL	10YR5/3	Few	Y	N (firm subangular blocky structure)	>10%	20%		Flint					
	48 – 95	mSL	10YR7/0	None	N	N	>10%	80%		Chalk					
AB 50	0 – 27	mCL	10YR4/3	None	N	N	>10%	5%		Flint		1	2	2	2
	27 – 55	hCL	10YR4/4	Few	N	N	>10%	8%		Flint					
	55 – 85	SCL	10YR5/4	Common	N	N	>10%	20%		Flint					
	85 – 120	SCL	10YR7/0	None	N	N	>10%	80%		Chalk					
AB 51	0 – 27	mCL	10YR4/3	None	N	N	1%	3%		Flint		1	2	3a	3a
	27 – 56	SCL	10YR4/4	Few	N	N	>10%	8%		Flint					
	56 – 72	SCL	10YR5/4	Common	N	N	>10%	20%		Flint					
	72 – 120	SCL	10YR7/0	None	N	N	>10%	70%		Chalk					
AB 52	0 – 28	hCL	7.5YR2.5/3	None	N	N	>10%	6%	1%	Hard stone	6	2	2	2	2
	28 – 50	hCL	7.5YR4/3	None	N	N	>10%	5%		Hard stone					
	50 – 70	SCL	7.5YR7/8	None	N	N	>10%								
	70 – 115	LmS	7.5YR7/6	None	N	N	>10%								
AB 53	0 – 28	hCL	7.5YR3/4	None	N	N	>10%	6%		Hard stone	5	2	2	2	2
	28 – 97	hCL	7.5YR4/3	None	N	N	>10%								
AB 54	0 – 27	mCL	10YR4/2	None	N	N	>10%	9%	0	Flint		1	3b	3a	3b
	27 – 46	hCL	10YR4/3	None	N	N	>10%	8%		Flint					
	46 – 70	SCL	10YR7/0	Few	Y	N (firm subangular blocky structure)	>10%	70%		Chalk					
AB 55	0 – 28	mCL	10YR4/2	None	N	N	5%	5%	0	Flint		1	3b	3a	3b
	28 – 46	hCL	10YR5/3	Few	Y	N (very firm subangular	5%	20%		Flint					

						blocky structure)									
	46 – 74	SCL	10YR7/0	Few	Y	N (very firm subangular blocky structure)	>10%	80%		Chalk					
AB 56	0 – 28	mCL	10YR4/2	None	N	N	>10%	5%		Flint		1	2	3a	3a
	28 – 45	SCL	10YR4/4	Few	N	N	>10%	8%		Flint					
	45 – 70	SCL	10YR7/0	Few	Y	N (firm subangular blocky structure)	>10%	60%		Chalk					
	70 – 120	mSL	10YR6/4	None	N	N	>10%	60%		Flint					
AB 57	0 – 26	mCL	7.5YR3/4	None	N	N	>10%	6%	1%	Hard stone		1	2	2	2
	26 – 39	mCL	7.5YR3/4	None	N	N	>10%	1%		Hard stone					
	39 – 82	mSL	7.5YR7/8	None	N	N	>10%	1%		Hard stone					
	82 – 108	LmS	7.5YR7/8	None	N	N	>10%	1%		Hard stone					
AB 58	0 – 25	mCL	10YR4/2	None	N	N	5%	5%		Flint		1	3a	3a	3a
	25 – 46	SCL	10YR5/3	Few	Y	N (firm subangular blocky structure)	>10%	8%		Flint					
	46 – 70	SCL	10YR7/0	Few	Y	N (firm subangular blocky structure)	>10%	70		Chalk					
	70 – 120	mSL	10YR7/0	None	N	N	>10%	80		Chalk					
AB 59	0 – 27	SCL	10YR4/2	None	N	N	>10%	4%		Flint		1	3a	2	3a
	27 – 50	SCL	10YR5/3	Few	Y	N (firm subangular blocky structure)	>10%	8%		Flint					
	50 – 96	mSL	10YR7/0	Few	Y	Granular structure	>10%	75%		Chalk					
AB 60	0 – 28	SCL	10YR4/2	None	N	N	>10%	3%		Flint		1	3a	3a	3a
	28 – 65	SCL	10YR5/3	Few	Y	N (firm subangular	>10%	20%		Flint					

						blocky structure)									
	65 – 92	LmS	7.5YR5/6	Few	N	N	>10%	5%		Flint					
	92 – 120	mS	7.5YR5/6	None	N	N	>10%			Flint					
AB 61	0 – 25	mCL	10YR4/2	None	N	N	5%	5	0	Flint		1	3a	3a	3a
	25 – 58	SCL	10YR5/3	Few	Y	N (firm subangular blocky structure)	>10%	8%		Flint					
	58 – 75	SCL	10YR5/3	Few	Y	N (firm subangular blocky structure)	>10%	30%		Flint					
	75 – 88	mSL	10YR7/0	None	N	N	>10%	8%		Flint					
AB 62	0 – 26	mCL	10YR4/2	None	N	N	>10%	3%		Flint		1	3a	3a	3a
	26 – 65	hCL	10YR5/3	Few	Y	N (firm subangular blocky structure)	>10%	20%		Flint					
	65 – 105	mS	7.5YR5/6	Few	N	N	>10%	5%		Flint					
	105 – 120	mS	10YR7/0	None	N	N	>10%	60		Chalk					
AB 63	0 – 30	hCL	7.5YR3/4	None	N	N	>10%	3%	1%	Hard stone	5	2	2	2	2
	30 – 95	hCL	7.5YR4/3	None	N	N	>10%	5%							
AB 64	0 – 25	mCL	10YR4/2	None	N	N	>10%	5%		Flint		1	3b	3a	3b
	25 – 45	mCL	10YR4/4	Few	N	N	>10%	20%		Flint					
	45 – 85	mSL	10YR7/0	None	N	N	>10%	30%		Chalk					
AB 65	0 – 30	mCL	10YR4/2	None	N	N	1%	3%		Flint		1	3a	3a	3a
	30 – 56	SCL	10YR5/3	Few	Y	N (firm subangular blocky structure)	5%	20%		Flint					
	56 – 70	SCL	7.5YR5/6	Few	N	N	5%	40%		Flint					
	70 – 85	mSL	7.5YR5/6	None	N	N	5%	40%		Flint					
AB 66	0 – 25	mCL	10YR4/2	None	N	N	5%	3%	1%	Flint		1	2	2	2

	25 – 42	hCL	10YR4/4	None	N	N	5%	8%		Flint					
	42 – 75	SCL	10YR5/4	Few	N	N	5%	8%		Flint					
	75 – 120	SCL	10YR5/6	Few	N	N	>10%	20%+10%		Flint + Chalk					
AB 67	0 – 27	mCL	7.5YR3/4	Few	N	N	>10%	6%	2%	Hard stone	5	1	2	2	2
	27 – 40	mCL	7.5YR3/4	None	N	N	>10%	1%							
	40 – 90	hCL	7.5YR6/4	None	N	N	>10%	1%							
	90 – 120	SCL	7.5YR5/6	None	N	N	>10%	1%							
AB 68	0 – 26	mCL	10YR4/2	None	N	N	1%	5%	0	Flint		1	2	3a	3a
	26 – 45	SCL	10YR5/3	Few	Y	N (firm subangular blocky structure)	>10%	8%		Flint					
	45 – 75	SCL	10YR7/0	None	N	N	>10%	60%		Chalk					
	75 – 120	mSL	10YR7/0	Few	Y	N (firm subangular blocky structure)	>10%	10% + 5%		Flint + Chalk					
AB 69	0 – 26	mCL	10YR4/2	None	N	N	1%	3%	1%	Flint		1	2	3a	3a
	26 – 55	SCL	10YR4/4	None	N	N	5%	8%		Flint					
	55 – 82	SCL	7.5YR5/6	Few	N	N	>10%	8%		Flint					
	82 – 120	SL	10YR5/6	Few	N	N	>10%	20%		Chalk					
AB 70	0 – 28	SCL	10YR4/2	None	N	N	5%	3%		Flint		1	2	3a	3a
	28 – 55	SCL	7.5YR5/6	Few	N	N	>10%	20%		Flint					
	55 – 100	mSL	10YR6/4	Few	Y	N (firm subangular blocky structure)	>10%	5%		Flint					
	100 – 120	mS	10YR6/4	None	N	N	>10%			Flint					
AB 71	0 – 25	SCL	10YR4/2	None	N	N	5%	3%		Flint		1	3a	3a	3a
	25 – 62	SCL	7.5YR5/6	Few	N	N	>10%	20%		Flint					
	62 – 85	mSL	10YR6/4	Common	Y	N (firm subangular blocky structure)	>10%	5%		Flint					

	85 – 110	mS	10YR6/4	Few	Y	N (firm subangular blocky structure)	>10%	5%		Flint					
AB 72	0 – 25	hCL	10YR4/2	None	N	N	>10%	3%	1%	Flint		2	3a	2	3a
	25 – 55	hCL	10YR4/4	Few	N	N	>10%	8%		Flint					
	55 – 72	SCL	7.5YR5/6	Common	N	N	>10%	20%		Flint					
	72 – 90	SCL	10YR7/0	Few	Y	N (firm subangular blocky structure)	>10%	80%		Chalk					
AB 73	0 – 27	hCL	7.5YR3/4	None	N	N	>10%	4%			5	2	2	2	2
	27 – 65	hCL	7.5YR4/3	None	N	N	>10%	2%							
	65 – 95	hZCL	7.5YR7/8	None	N	N	>10%	2%							
AB 74	0 – 27	hCL	10YR4/2	None	N	N	>10%	6%		Flint		2	3b	3a	3b
	27 – 58	hCL	10YR5/6	Few	Y	N (very firm medium subangular blocky structure)	>10%	20%		Flint					
AB 75	0 – 26	SCL	10YR4/2	None	N	N	5%	8%		Flint		1	3a	3a	3a
	26 – 33	SCL	10YR6/6	Few	Y	N (firm subangular blocky structure)	>10%	8%		Flint					
	33 – 78	SL	10YR7/8	Few	N	N	>10%	8%		FL + Chlk					
	78 – 120	mSL	10YR7/0	None	N	N	>10%	90%		Chalk					
AB 76	0 – 24	mCL	10YR4/2	None	N	N	5%	5%	1%	Flint		1	3a	3a	3a
	24 – 48	hCL	10YR4/4	Few	Y	N (very firm medium subangular blocky structure)	5%	40%		Flint					
	48 – 62	SCL	10YR7/0	Few	Y	N (very firm medium subangular blocky structure)	>10%	10%+ 15%		Flint + Chalk					

	62 – 120	SCL	10YR7/0	None	N	N	>10%	90%		Chalk					
AB 77	0 – 25	hCL	7.5YR3/4	None	N	N	>10%	5%	2%	Hard stone	5	2	2	2	2
	25 – 40	hCL	7.5YR3/4	None	N	N	>10%	1%							
	40 – 85	hCL	7.5YR6/4	None	N	N	>10%	1%							
	85 – 115	hCL	7.5YR7/8	Few	N	N	>10%	1%							
AB 78	0 – 25	mCL	7.5YR3/4	None	N	N	1%	6%	1%		5	1	3a	2	3a
	25 – 39	mCL	7.5YR3/4	None	N	N	5%	2%							
	39 – 85	SCL	7.5YR6/4	None	N	N	>10%	2%							
AB 79	0 – 25	mCL	10YR4/2	None	N	N	5%	5%	1%	Flint		1	3a	3a	3a
	25 – 45	SCL	10YR4/4	Few	Y	N (firm subangular blocky structure)	5%	40%		Flint					
	45 – 85	SCL	10YR7/0	Few	Y	N (firm subangular blocky structure)	>10%	50%		Chalk					
	85 – 120	SCL	10YR7/0	Few	Y	N (firm subangular blocky structure)	>10%	90%		Chalk					
AB 80	0 – 25	mCL	10YR4/2	None	N	N	5%	5%		Flint		1	2	3a	3a
	25 – 56	hCL	10YR4/4	Few	Y	N (very firm medium subangular blocky structure)	>10%	20%		Flint					
	56 – 85	mSL	7.5YR5/6	Common	Y	N (firm subangular blocky structure)	>10%	20%		Flint					
	85 – 120	mSL	10YR7/0	Few	Y	N (firm subangular blocky structure)	>10%	85%		Chalk					
AB 81	0 – 26	hCL	10YR4/2	None	N		>10%	3%		Flint		2	2	2	2

	26 – 54	hCL	10YR4/4	Few	Y	N (very firm medium subangular blocky structure)	>10%	8%		Flint					
	54 – 88	SCL	10YR5/4	Common	Y	N (firm subangular blocky structure)	>10%	40%		Flint					
	88 – 120	SCL	10YR7/0	Few	Y	N (firm subangular blocky structure)	>10%	80%		Chalk					
AB 82	0 – 30	hCL	7.5YR3/4	None	N	N	>10%	5%	2%	Hard stone	5	2	2	2	2
	30 – 45	SCL	7.5YR6/4	None	N	N	>10%	5%							
	45 – 90	mSL	7.5YR7/6	None	N	N	>10%	2%							
	90 – 120	LmS	7.5YR7/6	None	N	N	>10%	1%							
AB 83	0 – 24	hCL	10YR4/2	None	N	N	>10%	3%		Flint		2	2	2	2
	24 – 55	hCL	10YR4/4	Few	Y	N (firm subangular blocky structure)	>10%	8%		Flint					
	55 – 90	SCL	10YR5/4	Common	Y	N (firm subangular blocky structure)	>10%	40%		Flint					
	90 – 120	SCL	10YR7/0	Few	Y	N (firm subangular blocky structure)	>10%	70%		Chalk					
AB 84	0 – 25	mCL	10YR4/2	None	N	N	5%	7%		Flint		1	2	3a	3a
	25 – 57	SCL	10YR5/4	Few	Y	N (firm subangular blocky structure)	5%	8%		Flint					
	57 – 78	mSL	7.5YR5/6	Few	Y	N (firm subangular blocky structure)	>10%	8%		FL + Chlk					
	78 – 120	mS	10YR6/8	Few	N	N	>10%								

AB 85	0-27	hCL	7.5YR3/4	None	N	N	>10%	3%		Flint	4	2	2	2	2
	27 – 38	hCL	7.5YR3/4	None	N	N	>10%	1%			4				
	38 – 55	hCL	7.5YR3/4	None	N	N	>10%	1%							
	55 – 78	SCL	7.5YR3/4	None	N	N	>10%	1%							
	78+	SCL	2.5YR5/2	None	N	N	>10%	1%							
AB 86	0 – 27	mCL	7.5YR3/4	None	N	N	5%	6%	2%	Hard stone	5	1	1	2	2
	27 – 50	mCL	7.5YR3/4	None	N	N	5%	1%							
	50 – 90	SCL	7.5YR4/3	None	N	N	5%	2%							
	90 – 120	mSL	7.5YR6/4	None	N	N	>10%	2%							
AB 87	0 – 25	mCL	10YR4/2	None	N	N	5%	7%		Flint		1	2	2	2
	25 – 56	hCL	10YR5/4	Few	Y	N (very firm subangular blocky structure)	5%	8%		Flint					
	56 – 82	SCL	7.5YR5/6	Common	Y	N (firm subangular blocky structure)	>10%	8%		Flint					
	82 – 120	mSL	10YR7/0	Few	Y	N (firm subangular blocky structure)	>10%	30%		Chalk					
AB 88	0 – 29	mCL	10YR4/2	None	N	N	5%	5%		Flint		1	2	3a	3a
	29 – 65	SCL	10YR5/4	Few	Y	N (firm subangular blocky structure)	>10%	20%		Flint					
	65 – 90	mSL	7.5YR5/6	Common	Y	N (firm subangular blocky structure)	>10%	20%		Flint					
	90 – 120	mSL	10YR7/0	Few	Y	N (firm subangular blocky structure)	>10%	85%		Chalk					
AB 89	0 – 25	hCL	10YR4/2	None	N	N	>10%	5%		Flint		2	2	2	2

	25 – 58	hCL	10YR4/4	Common	Y	N (very firm subangular blocky structure)	>10%	8%		Flint					
	58 – 100	SCL	10YR5/4	Common	Y	N (firm subangular blocky structure)	>10%	20%		Flint					
	100 – 120	SCL	10YR7/0	Few	Y	N (firm subangular blocky structure)	>10%	75%		Chalk					
AB 90	0 – 30	hCL	7.5YR3/4	None	N	N	>10%	3%	2%	Hard stone	5	2	2	2	2
	30 – 60	hCL	7.5YR6/4	None	N	N	>10%	2%							
	60 – 105	mCL	7.5YR7/8	None	N	N	>10%	2%							
AB 91	0 – 25	hCL	10YR4/2	None	N	N	>10%	5%		Flint		2	3a	3a	3a
	25 – 54	hCL	10YR4/4	Common	Y	N (very firm subangular blocky structure)	>10%	8%		Flint					
	54 – 82	SCL	10YR5/4	Common	Y	N (firm subangular blocky structure)	>10%	20%		Flint					
AB 92	0 – 25	hCL	7.5YR3/4	None	N	N	>10%	6%	2%	Hard stone	5	2	2	2	2
	25 – 95	hCL	7.5YR7/6	None	N	N	>10%	2%							
	95 – 120	hCL	7.5YR7/1	None	N	N	>10%	2%							
AB 93	0 – 28	mCL	7.5YR3/4	None	N	N	5%	5%	2%	Hard stone	5	1	2	2	2
	28 – 45	mCL	7.5YR3/4	None	N	N	5%	1%							
	45 – 105	SCL	7.5YR5/6	None	N	N	>10%	1%							
	105 – 120	SCL	2.5YR5/2	None	N	N	>10%	1%							
AB 94	0 – 26	mCL	7.5YR3/4	None	N	N	5%	3%	1%	Hard stone	4 – 5	1	2	2	2
	26 – 45	mCL	7.5YR3/4	None	N	N	5%	3%		Hard stone					
	45 – 95	hCL	7.5YR4/3	None	N	N	5%	2%		Hard stone					

	95 – 120	hCL	7.5YR6/4	Few	Y	N (very firm subangular blocky structure)	5%	2%		Hard stone					
AB 95	0 – 28	SCL	10YR4/2	None	N	N	5%	5%		Flint		1	3a	3a	3a
	28 – 56	SCL	10YR4/4	Few	Y	N (firm subangular blocky structure)	>10%	20%		Flint					
	56 – 98	SCL	10YR7/0	None	N	N	>10%	50%		Chalk					
AB 96	0 – 26	mCL	10YR4/2	None	N	N	>10%	5%		Flint		1	2	3a	3a
	26 – 52	SCL	10YR5/4	Few	Y	N (firm subangular blocky structure)	>10%	8%		Flint					
	52 – 84	SCL	10YR7/0	Few	Y	N (firm subangular blocky structure)	>10%	5% + 20%		Flint + Chlk					
	84 – 120	mS	10YR6/8	Few	Y	N (firm subangular blocky structure)	>10%	2%		Flint					
AB 97	0 – 29	mCL	7.5YR3/4	None	N	N	>10%	6%	5%	Hard stone	5	1	3b	3a	3b
	29 – 60	mCL	7.5YR7/6	Few	N	N	>10%	2%							
	60 – 115	LmS	7.5YR7/8	None	N	N	>10%	2%							
AB 98	0 – 27	mCL	7.5YR3/4	None	N	N	>10%	6%	5%	Hard stone	5	1	2	2	2
	27 – 43	mCL	7.5YR3/4	None	N	N	>10%	2%							
	43 – 95	mCL	7.5YR4/3	None	N	N	>10%	2%							
	95 – 120	mCL	7.5YR3/4	None	N	N	>10%	2%							
AB 99	0 – 26	mCL	10YR4/2	None	N	N	5%	5%		Flint		1	2	2	3a
	26 – 62	SCL	10YR4/4	Few	Y	N (firm subangular blocky structure)	>10%	8%		Flint					
	62 – 120	mSL	10YR7/0	Common	Y	N (firm subangular	>10%	30%		Chalk					

						blocky structure)									
AB 100	0 – 27	mCL	7.5YR3/4	None	N	N	>10%	5%		Hard stone	5	1	3a	2	3a
	27 – 79	mCL	7.5YR3/4	Few	N	N	>10%	2%							
AB 101	0 – 27	mCL	7.5YR3/4	None	N	N	>10%	5%		Hard stone	5	1	3a	2	3a
	27 – 79	mCL	7.5YR3/4	Few	N	N	>10%	2%							
AB 102	0 – 30	mSL	7.5YR3/4	None	N	N	>10%	5%		Hard stone	5	1	2	3a	3a
	30 – 50	mSL	7.5YR6/4	None	N	N	>10%	5%							
	50 – 120	mSL	7.5YR6/4	None	N	N	>10%	2%							
AB Pit 2**	0 – 30	mCL	7.5YR3/4	None	N	N	>10%	5%	2%	Hard stone	4 – 5	1	2	3a	3a
	30 – 60	mCL	7.5YR3/4	None	N	N	>10%	5%							
	60 – 100	mSL	7.5YR4/4	None	N	N	>10%	5%							
	100 – 120	mZCL	7.5YR6/1	None	N	N	>10%	1%							

Key for Auger Bore Log

Soil Texture

mS, medium sand; LmS, loamy medium sand; mSL, medium sandy loam; mCL, medium clay loam; mZCL, medium silty clay loam; hCL, heavy clay loam; hZCL, heavy silty clay loam; SCL, sandy clay loam

Mottling

None: 0%
Few: <2%
Common: 2 – 20%

*Munsell colour code system

**Additional soil pit information is presented in Appendix A.2

Appendix A.2 – Soil pit profile characteristics

Auger Borehole	Horizon (cm)	Texture	Soil Matrix Colour	Mottling*	Gleyed horizon	Slowly permeable layer	CaCo3 %	Stone content			Structure	Strength	Roots
								>2cm	>6cm	Type			
AB 32 (Pit 1)	0 – 27	SCL	7.5YR3/2	None	N	N	>10%	6%	1%	Flint	Medium subangular blocky	Moderate firm	common, 10-25 of very fine & fine roots, 2-5 medium & coarse roots
	27 – 78	SCL	7.5YR4/2	None	N	N	>10%	5%	5%	Hard/soft	Medium subangular blocky	Very firm	
	78+		2.5YR7/1	Few	Y	N (<15cm thickness within 80cm of surface)	>10%	5%	5%	Hard/soft			
Pit 2	0 – 30	mCL	7.5YR3/4	None	N	N	>10%	5%	2%	Hard			few, 1-10 of very fine & fine roots, 1 - 2 medium & coarse roots
	30 – 60	mCL	7.5YR3/4	None	N	N	>10%	5%		Hard	Medium subangular blocky	Moderately weak	few, 1-10 of very fine & fine roots, 1 - 2 medium & coarse roots
	60 – 100	mSL	7.5YR4/4	None	N	N	>10%	1%		Hard	Fine granular	Loose	few, 1-10 of very fine & fine roots, 1 - 2 medium & coarse roots
	100 – 120	mZCL	7.5YR6/1	None	N	N	>10%	20%		Chalk	Fine granular	Very weak	

Appendix A.3 – Soil laboratory analysis

ANALYTICAL REPORT

Report Number	**78842-21**	**W680**	**MATT BARKER**
Date Received	**03-DEC-2021**		**MOTT MACDONALD**
Date Reported	**10-DEC-2021**		**10 TEMPLE BACK**
Project	**SOIL**		**BRISTOL**
Reference	**ANGLIAN WATER**		**BS1 6FL**
Order Number	**100102041**		

Laboratory Reference		**SOIL537704**	**SOIL537705**	**SOIL537706**	**SOIL537707**	**SOIL537708**					
Sample Reference		**PIT 1 TOPSOIL**	**PIT 2 TOPSOIL**	**PIT 2 SUBSOIL**	**PIT 2 SUBS OIL CHALKY**	**PSD 75**					
Determinand	**Unit**	**SOIL**	**SOIL**	**SOIL**	**SOIL**	**SOIL**					
Sand 2.00-0.063mm	% w/w	51	55	57	53	52					
Silt 0.063-0.002mm	% w/w	25	24	23	25	25					
Clay <0.002mm	% w/w	24	21	20	22	23					
Textural Class **		SCL	SCL	SCL	SCL	SCL					

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

** Please see the attached document for the definition of textural classes.

Reported by

Myles Nicholson

Natural Resource Management, a trading division of Cawood Scientific Ltd.
Coopers Bridge, Braziers Lane, Bracknell, Berkshire, RG42 6NS
[redacted]
email: enquiries@nrm.uk.com

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.

ANALYSIS REPORT

Contact : MATT BARKER
[redacted]
Tel. [redacted]

W680

Please quote the above code for all enquiries

Client : ANGLIAN WATER

Distributor : COST CODE 100102041

Sample Matrix : Agricultural Soil

Laboratory Reference
Card Number 81205/21

Date Received 03-Dec-21
Date Reported 10-Dec-21

SOIL ANALYSIS REPORT

Laboratory Sample Reference	Field Details			Index			mg/l (Available)		
	No.	Name or O.S. Reference with Cropping Details	Soil pH	P	K	Mg	P	K	Mg
547763/21	1	**R037-3 TOPSOIL** *No cropping details given*	**8.0**	**1**	**2-**	**2**	**12.0**	**149**	**52**
547764/21	2	**R037-3 SUBSOIL** *No cropping details given*	**7.7**	**0**	**1**	**1**	**7.4**	**113**	**43**
547765/21	3	**Y039-2 TOPSOIL** *No cropping details given*	**8.0**	**0**	**2-**	**1**	**8.4**	**134**	**42**
547766/21	4	**Y039-2 SUBSOIL** *No cropping details given*	**7.7**	**0**	**1**	**1**	**6.6**	**92**	**40**
547767/21	5	**G036-2 TOPSOIL** *No cropping details given*	**8.0**	**1**	**2-**	**1**	**14.8**	**135**	**41**
547768/21	6	**G036-2 SUBSOIL** *No cropping details given*	**8.2**	**0**	**1**	**1**	**7.4**	**105**	**45**

If general fertiliser and lime recommendations have been requested, these are given on the following sheets.
The analytical methods used are as described in DEFRA Reference Book 427
The index values are determined from the AHDB Fertiliser Recommendations RB209 9th Edition.

Released by *Sandy Cameron* On behalf of NRM Date *10/12/21*

MICRO NUTRIENT REPORT

DATE **10th December 2021**

SAMPLES FROM **ANGLIAN WATER**

MATT BARKER
[redacted]
Tel: [redacted]

Reference: **81205/547763/21**	Field Name: **R037-3 TOPSOIL**	**Result**	**(*)**	**Deficient**	**Marginal**	**Target**	**Marginal**	**Excessive**
Organic matter (LOI) %		3.6	**1**	*OM level data not available for this crop*				

Reference: **81205/547764/21**	Field Name: **R037-3 SUBSOIL**	**Result**	**(*)**	**Deficient**	**Marginal**	**Target**	**Marginal**	**Excessive**
Organic matter (LOI) %		2.8	**1**	*OM level data not available for this crop*				

Reference: **81205/547765/21**	Field Name: **Y039-2 TOPSOIL**	**Result**	**(*)**	**Deficient**	**Marginal**	**Target**	**Marginal**	**Excessive**
Organic matter (LOI) %		3.8	**1**	*OM level data not available for this crop*				

Reference: **81205/547766/21**	Field Name: **Y039-2 SUBSOIL**	**Result**	**(*)**	**Deficient**	**Marginal**	**Target**	**Marginal**	**Excessive**
Organic matter (LOI) %		3.5	**1**	*OM level data not available for this crop*				

Reference: **81205/547767/21**	Field Name: **G036-2 TOPSOIL**	**Result**	**(*)**	**Deficient**	**Marginal**	**Target**	**Marginal**	**Excessive**
Organic matter (LOI) %		4.4	**1**	*OM level data not available for this crop*				

Reference: **81205/547768/21**	Field Name: **G036-2 SUBSOIL**	**Result**	**(*)**	**Deficient**	**Marginal**	**Target**	**Marginal**	**Excessive**
Organic matter (LOI) %		3.4	**1**	*OM level data not available for this crop*				

Notes (*)

(1) NRM considers Organic soils to contain between 10-20% organic material with Peaty soils containing over 20% . The optimum ranges for Organic Matter which have been set are dependent on the soil type and the cropping but these must be viewed as guidance values only.

ANALYSIS REPORT

DATE 10th December 2021
SAMPLES FROM ANGLIAN WATER

SAMPLED BY COST CODE 100102041

Report reference 81205/21

MATT BARKER
[redacted]

Fertiliser Recommendations

The phosphate and potash recommendations shown below, are those required to replace the offtake and maintain target soil indices. The larger recommended applications for soils below target index will allow the soil to build up to this target index over a number of years. Not applying fertiliser to soils which are above target index will allow the soil to run down over a number of years to the target index.
The recommendation should be increased or decreased where yields are substantially more or less than that specified. The amount to apply can be calculated using the expected yield and values for the offtake of phosphate and potash per tonne of yield given in the RB209 9th edition.
All recommendations are given for the mid-point of each Index.
Where a soil analysis value (as given by the laboratory) is close to the range of an adjacent Index, the recommendation may be reduced or increased slightly taking account of the recommendation given for the adjacent Index. Small adjustments of less than 10 kg/ha are generally not justified.
Efficient use of P and K is most likely to be achieved on soils that are well structured and enable good rooting.
For visual evaluation of soil structure (VESS), a score on 1 or 2 would be considered adequate.
Don't forget to deduct nutrients applied as organic manures.
For Nitrogen recommendations please refer to the RB209 9th edition or seek advice from an FACTS qualified adviser.
Target Indices:
Arable, Forage, Grassland and Potato Crops: P Index 2, K Index 2-
(In rotations where most crops are Autumn-sown, soils are in good condition and P is applied annually, high index 1 can be an adequate target.)
Vegetables and Bulbs: P Index 3, K Index 2+
(If vegetables are only grown occasionally as part of an arable rotation, it would be most economic to target index 2 for arable and forage crops.)
Fruit Vines and Hops: P Index 2, K Index 2, Mg Index 2
(Note: Cider apples respond to K Index 3, Mg Index 3)
A lime recommendation is usually for a 20cm depth of cultivated soil or a 15cm depth of grassland soil. Where soil is acid below 20 cm and soils are ploughed for arable crops, a proportionately larger quantity of lime should be applied. However, if more than 10 t/ha is needed, half should be deeply cultivated into the soil and ploughed down, with the remainder applied to the surface and worked in.
For established grassland or other situations where there is no, or only minimal soil cultivation, no more than 7.5 t/ha of lime should be applied in one application.
In these situations, applications of lime change the pH below the surface very slowly. Consequently, the underlying soil should not be allowed to become too acidic because this will affect the root growth and thus limit nutrient and water uptake, which will adversely affect yield.

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime*	*(Arable)*	*(Grass)*
R037-3 TOPSOIL	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**0**	**0**
547763 /		*Kg/Ha*				*Te/Ha*	**0**	**0**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime*	*(Arable)*	*(Grass)*
R037-3 SUBSOIL	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**0**	**0**
547764 /		*Kg/Ha*				*Te/Ha*	**0**	**0**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime*	*(Arable)*	*(Grass)*
Y039-2 TOPSOIL	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**0**	**0**
547765 /		*Kg/Ha*				*Te/Ha*	**0**	**0**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime*	*(Arable)*	*(Grass)*
Y039-2 SUBSOIL	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**0**	**0**
547766 /		*Kg/Ha*				*Te/Ha*	**0**	**0**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime*	*(Arable)*	*(Grass)*
G036-2 TOPSOIL	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**0**	**0**
547767 /		*Kg/Ha*				*Te/Ha*	**0**	**0**

Fertiliser recommendations are based on **AHDB RB209 (Ninth Edition).** If a nutrient is deficient and no recommendation is given, either no recommendation is given in RB209 or we have insufficient data to give a recommendation. Apply Lime to the nearest half Ton / Tonne.
NRM is a UKAS accredited laboratory to ISO/IEC 17025

Report continued.....

ANALYSIS REPORT

DATE 10th December 2021
SAMPLES FROM ANGLIAN WATER

SAMPLED BY COST CODE 100102041

Report reference 81205/21

MATT BARKER
[redacted]

Fertiliser Recommendations

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
G036-2 SUBSOIL	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **0**	**0**
547768 /		*Kg/Ha*				*Te/Ha* **0**	**0**

Fertiliser recommendations are based on **AHDB RB209 (Ninth Edition).** If a nutrient is deficient and no recommendation is given, either no recommendation is given in RB209 or we have insufficient data to give a recommendation. Apply Lime to the nearest half Ton / Tonne.
NRM is a UKAS accredited laboratory to ISO/IEC 17025

ANALYSIS REPORT

Contact : MATT BARKER [redacted]

W680

Please quote the above code for all enquiries

Client : ANGLIAN WATER

Distributor : COST CODE 100102041

Sample Matrix : Agricultural Soil

Laboratory Reference

Card Number 81206/21

Date Received 03-Dec-21

Date Reported 13-Dec-21

SOIL ANALYSIS REPORT

Laboratory Sample Reference	Field Details			Index			mg/l (Available)		
	No.	Name or O.S. Reference with Cropping Details	Soil pH	P	K	Mg	P	K	Mg
547769/21	1	**R037-1 TOPSOIL** *No cropping details given*	**8.0**	**1**	**2-**	**1**	**13.6**	**137**	**41**
547770/21	2	**R037-1 SUBSOIL** *No cropping details given*	**8.1**	**0**	**1**	**1**	**7.4**	**112**	**34**
547771/21	3	**R037-4 TOPSOIL** *No cropping details given*	**8.0**	**1**	**2-**	**2**	**11.0**	**149**	**54**
547772/21	4	**R037-4 SUBSOIL** *No cropping details given*	**8.2**	**1**	**2-**	**1**	**9.8**	**132**	**49**
547773/21	5	**R037-5 TOPSOIL** *No cropping details given*	**8.2**	**2**	**2+**	**1**	**19.8**	**205**	**44**
547774/21	6	**R037-5 SUBSOIL** *No cropping details given*	**8.4**	**1**	**2-**	**1**	**9.6**	**145**	**38**

If general fertiliser and lime recommendations have been requested, these are given on the following sheets.
The analytical methods used are as described in DEFRA Reference Book 427
The index values are determined from the AHDB Fertiliser Recommendations RB209 9th Edition.

Released by *Nina Mansfield* On behalf of NRM Date *13/12/21*

MICRO NUTRIENT REPORT

DATE **13th December 2021**

SAMPLES FROM **ANGLIAN WATER**

MATT BARKER
[redacted]

Reference: **81206/547769/21**	Field Name: **R037-1 TOPSOIL**	**Result**	**(*)**	**Deficient**	**Marginal**	**Target**	**Marginal**	**Excessive**
Organic matter (LOI) %		3.3	1	*OM level data not available for this crop*				

Reference: **81206/547770/21**	Field Name: **R037-1 SUBSOIL**	**Result**	**(*)**	**Deficient**	**Marginal**	**Target**	**Marginal**	**Excessive**
Organic matter (LOI) %		2.7	1	*OM level data not available for this crop*				

Reference: **81206/547771/21**	Field Name: **R037-4 TOPSOIL**	**Result**	**(*)**	**Deficient**	**Marginal**	**Target**	**Marginal**	**Excessive**
Organic matter (LOI) %		3.3	1	*OM level data not available for this crop*				

Reference: **81206/547772/21**	Field Name: **R037-4 SUBSOIL**	**Result**	**(*)**	**Deficient**	**Marginal**	**Target**	**Marginal**	**Excessive**
Organic matter (LOI) %		3.0	1	*OM level data not available for this crop*				

Reference: **81206/547773/21**	Field Name: **R037-5 TOPSOIL**	**Result**	**(*)**	**Deficient**	**Marginal**	**Target**	**Marginal**	**Excessive**
Organic matter (LOI) %		3.1	1	*OM level data not available for this crop*				

Reference: **81206/547774/21**	Field Name: **R037-5 SUBSOIL**	**Result**	**(*)**	**Deficient**	**Marginal**	**Target**	**Marginal**	**Excessive**
Organic matter (LOI) %		2.6	1	*OM level data not available for this crop*				

Notes (*)

(1) NRM considers Organic soils to contain between 10-20% organic material with Peaty soils containing over 20% . The optimum ranges for Organic Matter which have been set are dependent on the soil type and the cropping but these must be viewed as guidance values only.

ANALYSIS REPORT

DATE 13th December 2021
SAMPLES FROM ANGLIAN WATER

SAMPLED BY COST CODE 100102041

Report reference 81206/21

MATT BARKER
[redacted]

Fertiliser Recommendations

The phosphate and potash recommendations shown below, are those required to replace the offtake and maintain target soil indices. The larger recommended applications for soils below target index will allow the soil to build up to this target index over a number of years. Not applying fertiliser to soils which are above target index will allow the soil to run down over a number of years to the target index.
The recommendation should be increased or decreased where yields are substantially more or less than that specified. The amount to apply can be calculated using the expected yield and values for the offtake of phosphate and potash per tonne of yield given in the RB209 9th edition.
All recommendations are given for the mid-point of each Index.
Where a soil analysis value (as given by the laboratory) is close to the range of an adjacent Index, the recommendation may be reduced or increased slightly taking account of the recommendation given for the adjacent Index. Small adjustments of less than 10 kg/ha are generally not justified.
Efficient use of P and K is most likely to be achieved on soils that are well structured and enable good rooting.
For visual evaluation of soil structure (VESS), a score on 1 or 2 would be considered adequate.
Don't forget to deduct nutrients applied as organic manures.
For Nitrogen recommendations please refer to the RB209 9th edition or seek advice from an FACTS qualified adviser.
Target Indices:
Arable, Forage, Grassland and Potato Crops: P Index 2, K Index 2-
(In rotations where most crops are Autumn-sown, soils are in good condition and P is applied annually, high index 1 can be an adequate target.)
Vegetables and Bulbs: P Index 3, K Index 2+
(If vegetables are only grown occasionally as part of an arable rotation, it would be most economic to target index 2 for arable and forage crops.)
Fruit Vines and Hops: P Index 2, K Index 2, Mg Index 2
(Note: Cider apples respond to K Index 3, Mg Index 3)
A lime recommendation is usually for a 20cm depth of cultivated soil or a 15cm depth of grassland soil. Where soil is acid below 20 cm and soils are ploughed for arable crops, a proportionately larger quantity of lime should be applied. However, if more than 10 t/ha is needed, half should be deeply cultivated into the soil and ploughed down, with the remainder applied to the surface and worked in.
For established grassland or other situations where there is no, or only minimal soil cultivation, no more than 7.5 t/ha of lime should be applied in one application.
In these situations, applications of lime change the pH below the surface very slowly. Consequently, the underlying soil should not be allowed to become too acidic because this will affect the root growth and thus limit nutrient and water uptake, which will adversely affect yield.

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
R037-1 TOPSOIL	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **0**	**0**
547769 /		*Kg/Ha*				*Te/Ha* **0**	**0**

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
R037-1 SUBSOIL	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **0**	**0**
547770 /		*Kg/Ha*				*Te/Ha* **0**	**0**

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
R037-4 TOPSOIL	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **0**	**0**
547771 /		*Kg/Ha*				*Te/Ha* **0**	**0**

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
R037-4 SUBSOIL	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **0**	**0**
547772 /		*Kg/Ha*				*Te/Ha* **0**	**0**

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
R037-5 TOPSOIL	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **0**	**0**
547773 /		*Kg/Ha*				*Te/Ha* **0**	**0**

Fertiliser recommendations are based on **AHDB RB209 (Ninth Edition).** If a nutrient is deficient and no recommendation is given, either no recommendation is given in RB209 or we have insufficient data to give a recommendation. Apply Lime to the nearest half Ton / Tonne.
NRM is a UKAS accredited laboratory to ISO/IEC 17025

Report continued.....

ANALYSIS REPORT

DATE 13th December 2021
SAMPLES FROM ANGLIAN WATER

SAMPLED BY COST CODE 100102041

Report reference 81206/21

MATT BARKER
[redacted]

Fertiliser Recommendations

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
R037-5 SUBSOIL	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **0**	**0**
547774 /		*Kg/Ha*				*Te/Ha* **0**	**0**

Fertiliser recommendations are based on **AHDB RB209 (Ninth Edition).** If a nutrient is deficient and no recommendation is given, either no recommendation is given in RB209 or we have insufficient data to give a recommendation. Apply Lime to the nearest half Ton / Tonne.
NRM is a UKAS accredited laboratory to ISO/IEC 17025

ANALYSIS REPORT

Contact : MATT BARKER [redacted]

Client : ANGLIAN WATER

W680

Please quote the above code for all enquiries

Distributor : COST CODE 100102041

Sample Matrix : Agricultural Soil

Laboratory Reference

Card Number 81207/21

Date Received 03-Dec-21

Date Reported 13-Dec-21

SOIL ANALYSIS REPORT

Laboratory Sample Reference	Field Details			Index			mg/l (Available)		
	No.	Name or O.S. Reference with Cropping Details	Soil pH	P	K	Mg	P	K	Mg
547775/21	1	**R037-2 TOPSOIL** *No cropping details given*	**8.2**	**2**	**2-**	**1**	**20.8**	**156**	**43**
547776/21	2	**R037-2 SUBSOIL** *No cropping details given*	**8.3**	**0**	**1**	**1**	**6.4**	**77**	**37**
547777/21	3	**Y039-4 TOPSOIL** *No cropping details given*	**8.0**	**1**	**1**	**1**	**13.8**	**120**	**46**
547778/21	4	**Y039-4 SUBSOIL** *No cropping details given*	**8.1**	**0**	**1**	**1**	**9.4**	**96**	**43**
547779/21	5	**G036-10 TOPSOIL** *No cropping details given*	**8.2**	**1**	**2-**	**1**	**10.8**	**126**	**35**
547780/21	6	**G036-10 SUBSOIL** *No cropping details given*	**8.2**	**0**	**1**	**1**	**8.6**	**118**	**35**

If general fertiliser and lime recommendations have been requested, these are given on the following sheets.
The analytical methods used are as described in DEFRA Reference Book 427
The index values are determined from the AHDB Fertiliser Recommendations RB209 9th Edition.

Released by Nina Mansfield On behalf of NRM Date 13/12/21

PAAG

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MICRO NUTRIENT REPORT

DATE **13th December 2021**

SAMPLES FROM **ANGLIAN WATER**

MATT BARKER
[redacted]

Reference: **81207/547775/21**	Field Name: **R037-2 TOPSOIL**	**Result**	**(*)**	**Deficient**	**Marginal**	**Target**	**Marginal**	**Excessive**
Organic matter (LOI) %		3.1	**1**	*OM level data not available for this crop*				

Reference: **81207/547776/21**	Field Name: **R037-2 SUBSOIL**	**Result**	**(*)**	**Deficient**	**Marginal**	**Target**	**Marginal**	**Excessive**
Organic matter (LOI) %		2.6	**1**	*OM level data not available for this crop*				

Reference: **81207/547777/21**	Field Name: **Y039-4 TOPSOIL**	**Result**	**(*)**	**Deficient**	**Marginal**	**Target**	**Marginal**	**Excessive**
Organic matter (LOI) %		5.7	**1**	*OM level data not available for this crop*				

Reference: **81207/547778/21**	Field Name: **Y039-4 SUBSOIL**	**Result**	**(*)**	**Deficient**	**Marginal**	**Target**	**Marginal**	**Excessive**
Organic matter (LOI) %		4.9	**1**	*OM level data not available for this crop*				

Reference: **81207/547779/21**	Field Name: **G036-10 TOPSOIL**	**Result**	**(*)**	**Deficient**	**Marginal**	**Target**	**Marginal**	**Excessive**
Organic matter (LOI) %		3.6	**1**	*OM level data not available for this crop*				

Reference: **81207/547780/21**	Field Name: **G036-10 SUBSOIL**	**Result**	**(*)**	**Deficient**	**Marginal**	**Target**	**Marginal**	**Excessive**
Organic matter (LOI) %		3.4	**1**	*OM level data not available for this crop*				

Notes (*)

(1) NRM considers Organic soils to contain between 10-20% organic material with Peaty soils containing over 20% . The optimum ranges for Organic Matter which have been set are dependent on the soil type and the cropping but these must be viewed as guidance values only.

ANALYSIS REPORT

DATE 13th December 2021
SAMPLES FROM ANGLIAN WATER

SAMPLED BY COST CODE 100102041

Report reference 81207/21

MATT BARKER
[redacted]

Fertiliser Recommendations

The phosphate and potash recommendations shown below, are those required to replace the offtake and maintain target soil indices. The larger recommended applications for soils below target index will allow the soil to build up to this target index over a number of years. Not applying fertiliser to soils which are above target index will allow the soil to run down over a number of years to the target index.
The recommendation should be increased or decreased where yields are substantially more or less than that specified. The amount to apply can be calculated using the expected yield and values for the offtake of phosphate and potash per tonne of yield given in the RB209 9th edition.
All recommendations are given for the mid-point of each Index.
Where a soil analysis value (as given by the laboratory) is close to the range of an adjacent Index, the recommendation may be reduced or increased slightly taking account of the recommendation given for the adjacent Index. Small adjustments of less than 10 kg/ha are generally not justified.
Efficient use of P and K is most likely to be achieved on soils that are well structured and enable good rooting.
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Don't forget to deduct nutrients applied as organic manures.
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Target Indices:
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(In rotations where most crops are Autumn-sown, soils are in good condition and P is applied annually, high index 1 can be an adequate target.)
Vegetables and Bulbs: P Index 3, K Index 2+
(If vegetables are only grown occasionally as part of an arable rotation, it would be most economic to target index 2 for arable and forage crops.)
Fruit Vines and Hops: P Index 2, K Index 2, Mg Index 2
(Note: Cider apples respond to K Index 3, Mg Index 3)
A lime recommendation is usually for a 20cm depth of cultivated soil or a 15cm depth of grassland soil. Where soil is acid below 20 cm and soils are ploughed for arable crops, a proportionately larger quantity of lime should be applied. However, if more than 10 t/ha is needed, half should be deeply cultivated into the soil and ploughed down, with the remainder applied to the surface and worked in.
For established grassland or other situations where there is no, or only minimal soil cultivation, no more than 7.5 t/ha of lime should be applied in one application.
In these situations, applications of lime change the pH below the surface very slowly. Consequently, the underlying soil should not be allowed to become too acidic because this will affect the root growth and thus limit nutrient and water uptake, which will adversely affect yield.

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime*	*(Arable)*	*(Grass)*
R037-2 TOPSOIL	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**0**	**0**
547775 /		*Kg/Ha*				*Te/Ha*	**0**	**0**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime*	*(Arable)*	*(Grass)*
R037-2 SUBSOIL	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**0**	**0**
547776 /		*Kg/Ha*				*Te/Ha*	**0**	**0**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime*	*(Arable)*	*(Grass)*
Y039-4 TOPSOIL	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**0**	**0**
547777 /		*Kg/Ha*				*Te/Ha*	**0**	**0**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime*	*(Arable)*	*(Grass)*
Y039-4 SUBSOIL	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**0**	**0**
547778 /		*Kg/Ha*				*Te/Ha*	**0**	**0**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime*	*(Arable)*	*(Grass)*
G036-10 TOPSOIL	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**0**	**0**
547779 /		*Kg/Ha*				*Te/Ha*	**0**	**0**

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NRM is a UKAS accredited laboratory to ISO/IEC 17025

Report continued.....

ANALYSIS REPORT

DATE 13th December 2021
SAMPLES FROM ANGLIAN WATER

SAMPLED BY COST CODE 100102041

Report reference 81207/21

MATT BARKER
[redacted]

Fertiliser Recommendations

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
G036-10 SUBSOIL	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **0**	**0**
547780 /		*Kg/Ha*				*Te/Ha* **0**	**0**

Fertiliser recommendations are based on **AHDB RB209 (Ninth Edition).** If a nutrient is deficient and no recommendation is given, either no recommendation is given in RB209 or we have insufficient data to give a recommendation. Apply Lime to the nearest half Ton / Tonne.
NRM is a UKAS accredited laboratory to ISO/IEC 17025

ANALYSIS REPORT

Contact : MATT BARKER
[redacted]

Client : ANGLIAN WATER

W680

Please quote the above code for all enquiries

Sample Matrix : Agricultural Soil

Laboratory Reference

Card Number 81234/21

Date Received 06-Dec-21

Date Reported 13-Dec-21

SOIL ANALYSIS REPORT

Laboratory Sample Reference	Field Details			Index			mg/l (Available)		
	No.	Name or O.S. Reference with Cropping Details	Soil pH	P	K	Mg	P	K	Mg
547870/21	1	**YO39-A TOPSOIL** *No cropping details given*	**7.5**	**1**	**2-**	**2**	**13.0**	**140**	**51**
547871/21	2	**YO39-1 SUBSOIL** *No cropping details given*	**7.3**	**0**	**1**	**1**	**8.8**	**106**	**50**

If general fertiliser and lime recommendations have been requested, these are given on the following sheets.
The analytical methods used are as described in DEFRA Reference Book 427
The index values are determined from the AHDB Fertiliser Recommendations RB209 9th Edition.

Released by Nina Mansfield On behalf of NRM Date 13/12/21

MICRO NUTRIENT REPORT

DATE **13th December 2021**

SAMPLES FROM **ANGLIAN WATER**

MATT BARKER
[redacted]

Reference: **81234/547870/21** Field Name: **YO39-A TOPSOIL**	**Result**	**(*)**	**Deficient**	**Marginal**	**Target**	**Marginal**	**Excessive**
Organic matter (LOI) %	3.9	**1**	*OM level data not available for this crop*				

Reference: **81234/547871/21** Field Name: **YO39-1 SUBSOIL**	**Result**	**(*)**	**Deficient**	**Marginal**	**Target**	**Marginal**	**Excessive**
Organic matter (LOI) %	3.4	**1**	*OM level data not available for this crop*				

Notes (*)

(1) NRM considers Organic soils to contain between 10-20% organic material with Peaty soils containing over 20% . The optimum ranges for Organic Matter which have been set are dependent on the soil type and the cropping but these must be viewed as guidance values only.

ANALYSIS REPORT

DATE 13th December 2021
SAMPLES FROM ANGLIAN WATER

SAMPLED BY

Report reference 81234/21

MATT BARKER
[redacted]

Fertiliser Recommendations

The phosphate and potash recommendations shown below, are those required to replace the offtake and maintain target soil indices. The larger recommended applications for soils below target index will allow the soil to build up to this target index over a number of years. Not applying fertiliser to soils which are above target index will allow the soil to run down over a number of years to the target index.
The recommendation should be increased or decreased where yields are substantially more or less than that specified. The amount to apply can be calculated using the expected yield and values for the offtake of phosphate and potash per tonne of yield given in the RB209 9th edition.
All recommendations are given for the mid-point of each Index.
Where a soil analysis value (as given by the laboratory) is close to the range of an adjacent Index, the recommendation may be reduced or increased slightly taking account of the recommendation given for the adjacent Index. Small adjustments of less than 10 kg/ha are generally not justified.
Efficient use of P and K is most likely to be achieved on soils that are well structured and enable good rooting.
For visual evaluation of soil structure (VESS), a score on 1 or 2 would be considered adequate.
Don't forget to deduct nutrients applied as organic manures.
For Nitrogen recommendations please refer to the RB209 9th edition or seek advice from an FACTS qualified adviser.
Target Indices:
Arable, Forage, Grassland and Potato Crops: P Index 2, K Index 2-
(In rotations where most crops are Autumn-sown, soils are in good condition and P is applied annually, high index 1 can be an adequate target.)
Vegetables and Bulbs: P Index 3, K Index 2+
(If vegetables are only grown occasionally as part of an arable rotation, it would be most economic to target index 2 for arable and forage crops.)
Fruit Vines and Hops: P Index 2, K Index 2, Mg Index 2
(Note: Cider apples respond to K Index 3, Mg Index 3)
A lime recommendation is usually for a 20cm depth of cultivated soil or a 15cm depth of grassland soil. Where soil is acid below 20 cm and soils are ploughed for arable crops, a proportionately larger quantity of lime should be applied. However, if more than 10 t/ha is needed, half should be deeply cultivated into the soil and ploughed down, with the remainder applied to the surface and worked in.
For established grassland or other situations where there is no, or only minimal soil cultivation, no more than 7.5 t/ha of lime should be applied in one application.
In these situations, applications of lime change the pH below the surface very slowly. Consequently, the underlying soil should not be allowed to become too acidic because this will affect the root growth and thus limit nutrient and water uptake, which will adversely affect yield.

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
YO39-A TOPSOIL	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **0**	**0**
547870 /		*Kg/Ha*				*Te/Ha* **0**	**0**

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
YO39-1 SUBSOIL	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **0**	**0**
547871 /		*Kg/Ha*				*Te/Ha* **0**	**0**

Fertiliser recommendations are based on **AHDB RB209 (Ninth Edition).** If a nutrient is deficient and no recommendation is given, either no recommendation is given in RB209 or we have insufficient data to give a recommendation. Apply Lime to the nearest half Ton / Tonne.
NRM is a UKAS accredited laboratory to ISO/IEC 17025

ANALYSIS REPORT

Contact : MATT BARKER [redacted]

W680

Please quote the above code for all enquiries

Client : ANGLIAN WATER

Local Rep : EMILY MARR

Telephone :

Sample Matrix : Agricultural Soil

Laboratory Reference

Card Number 81343/21

Date Received 09-Dec-21

Date Reported 20-Dec-21

SOIL ANALYSIS REPORT

Laboratory Sample Reference	Field Details			Index			mg/l (Available)		
	No.	Name or O.S. Reference with Cropping Details	Soil pH	P	K	Mg	P	K	Mg
548386/21	1	**G036-1 TOPSOIL** *No cropping details given*	**8.1**	**1**	**1**	**1**	**11.2**	**81**	**38**
548387/21	2	**G036-1 SUBSOIL** *No cropping details given*	**8.4**	**0**	**0**	**1**	**7.0**	**48**	**26**

If general fertiliser and lime recommendations have been requested, these are given on the following sheets.
The analytical methods used are as described in DEFRA Reference Book 427
The index values are determined from the AHDB Fertiliser Recommendations RB209 9th Edition.

Released by Nina Mansfield On behalf of NRM Date 20/12/21

MICRO NUTRIENT REPORT

DATE **20th December 2021**

SAMPLES FROM **ANGLIAN WATER**

MATT BARKER
[redacted]

Reference: **81343/548386/21** Field Name: **G036-1 TOPSOIL**	**Result**	**(*)**	**Deficient**	**Marginal**	**Target**	**Marginal**	**Excessive**
Organic matter (LOI) %	4.8	**1**	*OM level data not available for this crop*				

Reference: **81343/548387/21** Field Name: **G036-1 SUBSOIL**	**Result**	**(*)**	**Deficient**	**Marginal**	**Target**	**Marginal**	**Excessive**
Organic matter (LOI) %	3.0	**1**	*OM level data not available for this crop*				

Notes (*)

(1) NRM considers Organic soils to contain between 10-20% organic material with Peaty soils containing over 20% . The optimum ranges for Organic Matter which have been set are dependent on the soil type and the cropping but these must be viewed as guidance values only.

ANALYSIS REPORT

DATE 20th December 2021
SAMPLES FROM ANGLIAN WATER

SAMPLED BY EMILY MARR

Report reference 81343/21

MATT BARKER
[redacted]

Fertiliser Recommendations

The phosphate and potash recommendations shown below, are those required to replace the offtake and maintain target soil indices. The larger recommended applications for soils below target index will allow the soil to build up to this target index over a number of years. Not applying fertiliser to soils which are above target index will allow the soil to run down over a number of years to the target index.
The recommendation should be increased or decreased where yields are substantially more or less than that specified. The amount to apply can be calculated using the expected yield and values for the offtake of phosphate and potash per tonne of yield given in the RB209 9th edition.
All recommendations are given for the mid-point of each Index.
Where a soil analysis value (as given by the laboratory) is close to the range of an adjacent Index, the recommendation may be reduced or increased slightly taking account of the recommendation given for the adjacent Index. Small adjustments of less than 10 kg/ha are generally not justified.
Efficient use of P and K is most likely to be achieved on soils that are well structured and enable good rooting.
For visual evaluation of soil structure (VESS), a score on 1 or 2 would be considered adequate.
Don't forget to deduct nutrients applied as organic manures.
For Nitrogen recommendations please refer to the RB209 9th edition or seek advice from an FACTS qualified adviser.
Target Indices:
Arable, Forage, Grassland and Potato Crops: P Index 2, K Index 2-
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Vegetables and Bulbs: P Index 3, K Index 2+
(If vegetables are only grown occasionally as part of an arable rotation, it would be most economic to target index 2 for arable and forage crops.)
Fruit Vines and Hops: P Index 2, K Index 2, Mg Index 2
(Note: Cider apples respond to K Index 3, Mg Index 3)
A lime recommendation is usually for a 20cm depth of cultivated soil or a 15cm depth of grassland soil. Where soil is acid below 20 cm and soils are ploughed for arable crops, a proportionately larger quantity of lime should be applied. However, if more than 10 t/ha is needed, half should be deeply cultivated into the soil and ploughed down, with the remainder applied to the surface and worked in.
For established grassland or other situations where there is no, or only minimal soil cultivation, no more than 7.5 t/ha of lime should be applied in one application.
In these situations, applications of lime change the pH below the surface very slowly. Consequently, the underlying soil should not be allowed to become too acidic because this will affect the root growth and thus limit nutrient and water uptake, which will adversely affect yield.

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
G036-1 TOPSOIL	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **0**	**0**
548386 /		*Kg/Ha*				*Te/Ha* **0**	**0**

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
G036-1 SUBSOIL	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **0**	**0**
548387 /		*Kg/Ha*				*Te/Ha* **0**	**0**

Fertiliser recommendations are based on **AHDB RB209 (Ninth Edition).** If a nutrient is deficient and no recommendation is given, either no recommendation is given in RB209 or we have insufficient data to give a recommendation. Apply Lime to the nearest half Ton / Tonne.
NRM is a UKAS accredited laboratory to ISO/IEC 17025

Get in touch

You can contact us by:

Emailing at **info@cwwtpr.com**

Calling our Freephone information line on **0808 196 1661**

Writing to us at **Freepost: CWWTPR**

You can view all our DCO application documents and updates on the application on The Planning Inspectorate website:

https://infrastructure.planninginspectorate.gov.uk/projects/eastern/cambridge-waste-water-treatment-plant-relocation/