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Geological notes and local details for 1:10 000 sheets TM 29 SW and SE Hempnall and Woodton

Part of 1:50 000 Sheets 175 (Diss) and 176 (Lowestoft)

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Hempnall and Woodton

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PREFACE

This report describes the geology of 1:10 000 geological sheets TM 29 SW & 29 SE. The area was first surveyed on the 1 inch to 1 mile scale by H.B. Woodward in 1875-9 and the results published in 1881 as part of Old Series One - Inch Sheet 66 SE. A descriptive memoir was published in the same year. Information on the geology of the area is also contained in Wartime Pamphlet No. 20 (part 4).

The primary six-inch survey was carried out by R.J. Wyatt in 1980 under the direction of Dr. R.A. Bazley, District Geologist.

Uncoloured dyeline copies of sheets TM 29 SW & SE can be obtained through the Bookstall, Geological Museum, Exhibition Road.

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Geological notes and local details for 1:10 000 sheet TM 29 SW and SE Hempnall and Woodton

R. J. Wyatt

INTRODUCTION

The area covered by sheets TM 29 SW & SE lies about 15 km SSE of Norwich and is part of a widespread boulder clay - covered plateau drained to the north by the R. Tas and to the east by the Broome Beck. The only settlements are a few villages, of which Hempnall and Woodton are the largest, and scattered farms. The area is largely devoted to agriculture. Drift deposits cover the whole district, those older than the Boulder Clay being exposed in the river valleys only. Solid formations beneath the Drift are known from the records of scattered boreholes and from pits to the west of Hempnall.

GEOLOGICAL SEQUENCE

The solid formations and drift deposits on the 1:10 560 geological maps are listed below.

SUPERFICIAL DEPOSITS (DRIFT)

Recent and Pleistocene

- Alluvium
- Peat
- River Terrace Deposits (Terrace 1 & 2)
- Head
- Coversand
- Boulder Clay

Glacial Laminated Sediments

Glacial Sand and Gravel

Beccles Formation

SOLID FORMATIONS (concealed)

Norwich Crag

Chalk

CONCEALED STRATA

CHALK

Most of the water wells in the area penetrate chalk, a maximum thickness of 109 m being proved in a well 1.5 km SSW of Topcroft Street (2605 9039). Drillers' logs only briefly characterize the strata as chalk or chalk containing flints. The inferred subcrop distribution of chalk zones suggests that the wells penetrate only the Upper (Senonian) Chalk in the zones of Gonioteuthis quadrata and Belemnitella mucronata (Peake & Hancock, 1970).

NORWICH CRAG

The Norwich Crag does not crop out within the area but is known from boreholes and exposures in gravel pits; its extent and thickness is poorly documented and from drillers' records it is often impossible to distinguish between the sands of the Norwich Crag and those of the Beccles Formation. In a few boreholes a bed of green-coated flints is mentioned as overlying the Chalk; such a flint nodule bed is characteristic of the base of the Norwich Crag. Where shells are mentioned it can be assumed to indicate the presence of this formation. In addition, sands are sometimes

recorded as being black in drillers' logs and this can be regarded as a loose description of dark green, the colour characteristic of Norwich Crag below the water table where it is unoxidized.

Deposits which, on the basis of the high flint content of its gravel, are thought to correlate with the Norwich Crag of the type area (Cox & Poole, in press; Funnell & others, 1979) were observed at the base of the eastern face of Morningthorpe Gravel Pit beneath the glacial sand and gravel (2205 9446). They comprise 3 m of orange, yellow and fawn, fine- to medium-grained, well-sorted and well-rounded, slightly micaceous, flat-bedded and cross-bedded sands with rare clay laminae. In one part of the face strings of well-rounded flint pebbles coalesce into a thick body of well-packed, bedded shingle. Sub-rounded to well-rounded flint pebbles comprise over 95% of this shingle, whilst quartz and quartzite together constitute less than 5%. No shells were found in the sands at Morningthorpe, but there are non-fossiliferous beds in the Norwich Crag of the type area, and leaching by circulating groundwater could have removed any shells that were originally present.

In the old gravel pit at Mill Farm to the west (2086 9494) up to 4.0 m of well-rounded, mature, bedded, densely packed shingle with a yellow well-sorted sand matrix underlies glacial sand and gravel, the latter channelling down into it. This shingle is closely comparable to that of the Morningthorpe Pit.

The composition of these gravels is remarkably similar to that of the Westleton Beds (Hey 1967, p. 430), even to the presence of pinhole chert in the finer grades, the only significant difference being the very low percentage (up to 5%) of angular/sub-angular flints in the former. The Westleton Beds are now regarded as a

facies of the Norwich Crag (Funnell & West, 1977). The composition of the gravels contrasts markedly with that of the gravel at Woodton (see p. 5) which contains a much greater proportion of quartz and quartzite and which is thought to correlate with the Beccles Formation of the Waverney Valley, despite the similarity of their associated sands to those at Morningthorpe and Mill Farm.

DRIFT DEPOSITS

BECCLES FORMATION

The Beccles Formation, as defined at the type locality (Wilcox & Horton, 1981), comprises the deposits between the Norwich Crag and the glacial sand and gravel. They consist of a lower sequence of clean, well-sorted, well-rounded, bedded sands with subordinate gravels and an upper sequence of similar deposits in which thin layers of chalky sand are not uncommon. Locally, as in the Harleston area, the two sequences are separated by a distinctive buff-brown, loamy, pebbly, slightly chalky clay which in some localities is bedded in part. This has been defined as the Starston Till Member (Lawson 1981).

In the Woodton area there is an extensive outcrop of beds corresponding to the Beccles Formation of the Waveney Valley. They comprise fine- and medium-grained clean sands with a small proportion of gravel, and give rise to light sandy soils. They were formerly exploited and there are several overgrown pits around Woodton. The only existing exposure, however, is in the flooded pit at Fox Burrows (2945 9365) where up to 3.5 m of pale orange and yellowish brown, medium-grained, well-sorted, slightly micaceous, laminated and ripple-drift bedded sands occur. There are a few clay and silt

laminae and, near the top, some well-rounded gravel with a high proportion of quartz and quartzite pebbles (up to 63%). These deposits are thought to be equivalent to beds underlying the Starston Till in the Waveney Valley.

In Morningthorpe Gravel Pit (2206 9445) a 3m-wide channel cutting into the Norwich Crag and planed off at the top by the overlying glacial sand and gravel is filled with buff or fawn loamy clay containing scattered flint and quartz pebbles. The deposit is thinly bedded in part and includes a few stringers and lenses of fine chalky gravel. It has some of the characteristics, including bedding, of a flow-till. The deposit is clearly comparable to the Starston Till of the Waveney Valley and to the Norwich Brickearth of Norfolk generally, both of which are considered to represent the same early Anglian glacial episode (Lawson 1981).

The thickness of the Beccles Formation cannot be established in the Hempnall - Woodton area because it is difficult to differentiate the beds from Norwich Crag in drillers' logs of water wells. In the adjoining Waveney Valley, however, thicknesses up to 30 m have been estimated (Wilcox and Horton, 1981). The channelled nature of the top of the Beccles Formation suggests that there is considerable variation in its thickness.

The uniformity, good sorting and good rounding of sands of the Beccles Formation, together with sedimentary structures such as cross-bedding and ripple-drift bedding, suggest deposition in shallow water subject to moderate currents. The occurrence of even lamination at some localities suggests deposition in the upper flow regime. The incoming of fine chalky detritus towards the top of the formation may indicate a glacial source for the sediment. The sands may represent the sediments of a distal outwash plain.

GLACIAL DRIFT, UNDIFFERENTIATED

Within the Waveney Valley, to the immediate south of the present area, deposits classified on the maps as undifferentiated glacial drift comprise a variable sequence of bedded sands, gravels, silts, clays, and pebbly clays which occupy shallow depressions cutting into the underlying Beccles Formation. Such deposits were not seen in the Hempnall - Woodton area during the present survey but records of old pit sections in the vicinity of Woodton suggest that they may be present.

Thus, an old pit [2813 9453] , now overgrown and flooded, 300 m ESE of Hill House Farm, formerly exposed fine-grained evenly bedded sand 1.8 m, on marly brickearth containing small chalk pebbles 0.6 - 2.6 m, overlying fine-grained white chalky cross-bedded sand with seams of chalk gravel 1.8 m (Woodward, 1881, p. 107). These deposits could not be detected at outcrop nearby and may be restricted to a channel of limited extent.

In another overgrown pit [2889 9459] 350 m ESE of All Saints' Church, Woodton, Woodward (ibid, p. 107) recorded up to 3.1 m of fine sand, overlying 1.8m of flint gravel containing a few foreign pebbles, rolled chalk fragments, grey clay and lignite, and shell fragments.

Just to the west of Hempnall, in the bank of the R. Tas [2345 9473] , coarse gravel at the base of the alluvium is underlain by 2.9 m of pale putty-coloured sandy silt and clay containing small chalk and flint pebbles and small angular flints in the upper part. Similar pale grey sandy clay is present below coarse gravel 300 m NE of Beach Farm [2340 9393] . The stratigraphical status of this deposit is uncertain, but the probability is that it is contemporaneous with the undifferentiated glacial drift.

GLACIAL SAND AND GRAVEL

The glacial sand and gravel crops out on the valley slopes of the R. Tas and of a minor tributary east of Hempnall, and also appears to floor these valley beneath the Recent alluvial and peat deposits. The gravel also occurs as isolated small patches in the vicinity of Woodton and on the flanks of the Broome Beck valley S.E. of the village where, again, they appear to extend beneath the valley floor.

The maximum thickness of the glacial sand and gravel (6 m) was recorded in Morningthorpe Gravel Pit. The extent and thickness of these deposits beneath the boulder clay - covered plateau is uncertain because of the difficulty of differentiating between the glacial sand and gravel and the underlying sands and gravels in drillers' logs. The outcrop distribution both in this and adjacent areas indicates, however, that the thickness probably varies greatly, and in many localities the deposits are absent.

The gravels are for the most part very coarse, crudely bedded, commonly cross-bedded, very poorly sorted and locally quite ferruginous. They are composed mainly of flint cobbles and large well-worn nodular flints up to 0.35 m across, but pebbles and cobbles of quartzite are common and there are scattered boulders of brown quartzitic sandstone. Jurassic/Cretaceous sandstone and ironstone are subordinate and igneous erratics, such as dolerite, are rare. The matrix is generally composed of fine to medium flint gravel and coarse gritty sand. There are scattered lenses and beds of finer, better sorted gravel, pebbly sand and clean-washed sand, the last containing abundant chalk grains in places.

The base of the Glacial Sand and Gravel was seen to channel markedly into the underlying sands and shingle in the Morningthorpe and Mill Farm gravel pits. South-east of Woodton the gravels drape

the valley slopes of the Broome Beck and extend below the valley floor, suggesting that the present valley follows the course of a pre-existing valley (see also Wilcox & Horton, 1981).

The content, grain size, sorting and bedding characteristics of these deposits suggest deposition in a very high energy regime, probably from glacial meltwaters in advance of an encroaching ice sheet which ultimately covered the area and deposited the overlying chalky lodgement till.

GLACIAL LAMINATED SEDIMENTS

Glacial laminated sediments have been recognized overlying the glacial sand and gravel in and immediately adjacent to Morningthorpe Gravel Pit (2189 9428), and also to the immediate north and east of Hempnall. In the former locality they comprise up to 1.8 m of pale brown very evenly laminated silty clays and clayey silts in thin layers averaging 2 cm in thickness, with intermittent thin beds of yellow fine-grained clayey sand. Up to 2.0 m of yellow, fine-grained, well-sorted sand with ill-defined, far less regular bedding and infrequent clay laminae are present beneath.

Closely comparable sediments were mapped near Hempnall. There were no exposures but pale brown to orange-brown clay and silty clay could be augered and, in freshly ploughed fields, clods of similar material with fine lamination were observed. Pale orange micaceous clayey silt was dug from a recently cleaned ditch at (2447 9409).

The fine grain size and regular lamination of the bulk of these deposits suggest deposition in still water, the most likely environment being that of pro-glacial lakes.

BOULDER CLAY

The boulder clay, which was surveyed on a rapid reconnaissance basis only, covers c 85% of the area. It forms an extensive, almost flat plateau at an average elevation of about 50 m O.D. which is dissected by a few shallow valleys draining either northwards into the R. Tas or eastwards into the Broome Beck. The deposit gives rise to fertile stony clay loams, ideal for arable farming.

At depth, where unweathered, the boulder clay constitutes stiff, grey, stony, silty to sandy clays with variable proportions of pebbles, cobbles and boulders. Chalk in the form of fine debris, as well as discrete rounded pebbles and blocks, is almost invariably the dominant clast component, but angular and nodular flints are also abundant; quartzite and coarse quartzose sandstone erratics are common, and there is a scattering of Jurassic limestones and sandstones; igneous erratics are rare.

Weathering of the boulder clay produces yellowish brown chalky stony clays in the top 1-2 m, but the uppermost $\frac{1}{2}$-1 m is widely decalcified, giving rise to orange-brown stony clays. The deposit as a whole appears to be very uniform in character throughout the area. Its thickness, as proved in water wells, ranges up to 26 m. The mapped base indicates that it locally occupies channels cut into the underlying sediments; this is particularly evident 1.5 km east of Hempnall where it cuts down sharply through the glacial laminated sediments into the underlying gravels.

At the base of the boulder clay in the Morningthorpe Gravel Pit (2189 9438) there are upto 0.4 m of unevely interbedded clayey silt and clayey sand containing chalk pellets and flint chips, with a layer of flint - chalk gravel at the bottom, resting with a sharp junction on the laminated sediments below. These deposits probably

represent poorly sorted outwash sediments or flow till laid down before the emplacement of chalky lodgement till beneath a continental ice sheet (the Lowestoft Till).

Restricted occurrences of chalky till have been observed at lower levels in the glacial sequence. Thus, 350 m east of Hempnall Church a small outcrop (2450 9444) occurs beneath the glacial laminated sediments. And, in the Morningthorpe Gravel Pit (2206 9445), chalky till was seen to fill a channel beneath the glacial sand and gravel and cutting into the Norwich Crag; it was also present here as a large 0.5 m- thick lens just above the base of the glacial gravels. These occurrences probably represent episodes of restricted till deposition during the earlier part of the Anglian glaciation prior to the emplacement of the main Lowestoft Till sheet.

COVERSAND

On the Boulder Clay covered plateau bordering the valley of the R. Tas between Stratton St. Michael and Hempnall there is a patchy veneer of loamy sand which rarely exceeds 1 m in thickness. It gives rise to areas of light loamy soil in an area otherwise characterized by heavy clay soils. Because of its thinness and impersistence the deposit has not been mapped. It was exposed in the south face of Morningthorpe Gravel Pit (2180 9428) where it comprised up to 0.4 m of orange-brown, medium- to coarse-grained, well-sorted sand with a few scattered flints. The base was irregularly festooned into the underlying boulder clay.

The origin of this deposit is uncertain. Its uniformity and good sorting suggest that it may be derived from windblown sand, but the occasional presence of scattered flints or gravelly streaks implies that, at least in part, it has been reworked and waterlaid.

HEAD

Head deposits occupy the floors of several shallow valleys. For the most part they comprise slightly gravelly sandy loams with scattered flint and quartzite pebbles. Locally, however, there are also stony clayey sands and sandy clays.

SECOND TERRACE

A small patch of gravel in the southern part of Woodton (2930 9385) occupies a flat-topped spur between the two headwater streams of Broome Beck. The surface of the gravel spread is approximately 6 m above the river alluvium. The deposit can be seen at the top of a degraded working face in the former sand pit in the village (2925 9384) where it comprises about 1 m of coarse poorly sorted flint-rich gravel overlying the sands of the Beccles Beds. The deposit is similar to the glacial gravels that crop out nearby, but is regarded as a terrace remnant because of its topographical expression. It probably represents glacial gravel that has been subject to reworking by river action.

FIRST TERRACE

Fox Burrows, a flat-topped area situated at the confluence of the Broome Beck headwater streams, is covered by up to 1 m of river gravel the surface level of which is c 2 m above the river alluvium. The gravel is exposed in a few small degraded exposures in the banks of a flooded pit (2950 9365) . It is coarse (cobbles up to 0.15 m across), fairly well-rounded but not well-sorted, and composed dominantly of flints. Quartz and quartzite are also present and the matrix is a coarse gritty sand. The gravel pockets slightly into the underlying sands.

PEAT

Peaty deposits are commonly present along the floor of the R. Tas. They occupy a narrow bench falling from the base of the steeper valley slope cut in glacial deposits down to the alluvial flat bordering the river. They give rise to stretches of wet, boggy land.

Fibrous detrital peat occurs locally but the deposit more generally comprises black very peaty sand. The sand component may be derived from the glacial deposits of the higher slopes by a process of hillwash. Alternatively, it may be aeolian in origin (cf. the ?coversand deposits overlying the boulder clay, p. 10).

Immediately north of Morningthorpe Gravel Pit [2187 9462] the peat was seen to pass beneath the alluviual clay of the R. Tas flood plain. It almost invariably overlies coarse, poorly sorted gravel which may be either glacial sand and gravel or the oldest alluvial deposit (p. 13). The fact that waterlogged conditions are associated with what might be expected to be a free-draining gravel is best explained by assuming that the input of water into the gravel is so high that it is permanently waterlogged.

The thickness of the peaty deposits is commonly in the order of 0.5 m, but locally exceeds 1.1 m.

ALLUVIUM

The alluvium of both the R. Tas and the Broome Beck is characteristically a dark brown silty and sandy clay containing very few small pebbles. In the upper part of Broome Beck, however, there is also dark brown and grey clayey sand with scattered small flints. The alluvium at the eastern margin of the area, S.E. of Woodton, is very humic. These deposits are generally less than 1 m in thickness, but a maximum of 1.8 m was recorded near St. Andrew's Church, Woodton

(2831 9351).

The alluvial clay generally rests upon coarse, poorly sorted, flint-rich gravel, although in the Tas valley a thin peat locally intervenes. This gravel is probably an older alluvial deposit laid down during a period of high water discharge.

A RESUMÉ OF THE GLACIAL HISTORY AND CORRELATION

Following deposition of the Norwich Crag under shallow water marine conditions there was a break in sedimentation before the sands and subordinate quartz/quartzite-rich gravels of the Beccles Formation were laid down. These sands and gravels probably represent mainly fluvioglacial sediments of a distal glacial outwash plain. The impersistent equivalent of the Starston Till (i.e. Norwich Brickearth) near the middle of the sequence testifies to a more fully glacial episode when the North Sea Ice extended to its maximum limit in the vicinity of the Waveney Valley.

The age of the Beccles Formation is uncertain but in many respects the sands and gravels resemble the Kesgrave Sand and Gravel of Essex and S. Suffolk even to the rare occurrence of a reddened horizon at the top of the sequence (West 1980; Wilcox & Horton, 1981). The Kesgrave Sand and Gravel has been dated as pre-Cromerian by Rose and Allen (1977) on the basis that the reddened horizon represents a temperate interglacial episode. However, the Norwich Brickearth is widely regarded as being of early Anglian age, post-dating known Cromerian deposits on the coast. Thus, at least the upper part of the Beccles Formation is likely to be of Anglian age. Succeeding glacial deposits, up to and including the chalky Boulder Clay, predate the Hoxnian interglacial deposits in the Waveney Valley and are thus also of Anglian age.

Following deposition of the Beccles Formation there was a renewed advance of ice from which was initially deposited the very coarse proximal outwash gravels and the complex localised sequences of glacial sediments designated Glacial Drift, Undifferentiated. The latter probably represent a mixture of lodgement till, flow till, glacial lake sediments and outwash deposits. The undifferentiated drift and some of the coarse gravels occupy linear depressions which may be pre-existing river valleys or glacial tunnel - valleys. Prior to the succeeding maximum glacial advance, which covered the greater part of East Anglia, glacial laminated sediments were formed in scattered ponds and lakes. During this major glacial episode a thick and ubiquitous mantle of chalky lodgement till (the Lowestoft Till) was emplaced.

There are no younger glacial deposits in the area under consideration. The river terraces probably date from interstadial or interglacial episodes during the Devensian Stage, the Head to a late-Devensian periglacial period, and the peat and alluvium to the temperate post-glacial phase.

DETAILED NOTES

TM 29 SW

Old gravel pit at Mill Farm (2086 9494)

Glacial Sand & Gravel

Interbedded coarse-grained, ferruginous, slightly pebbly sands and very coarse, poorly sorted gravels, mainly of much abraded flints up to 0.35 m across; matrix of coarse gravelly sand; all in thick wedge-bedded units; fills channels cut into underlying deposit ... 2.0 - 3.5

Norwich Crag

Bedded, mature, well-rounded flint gravel with a matrix of yellow or orange, fine-grained, well-sorted, clean sand; some ferruginous beds and lenses ... 2.2 - 4.0

Morningthorpe Gravel Pit (c 220 944) - composite section

?Coversand

Orange-brown medium- and coarse-grained, well-sorted sand with scattered small flints; festooned up to 0.4 m into the underlying boulder clay ... 0.4

Boulder Clay

Stiff grey silty sandy clay with abundant chalk pebbles and cobbles and fine chalk debris; also many flints. Unevenly interbedded fawn clayey silt and rusty-brown fine-grained clayey sand with scattered chalk pellets and flint chips in basal 0.2 - 0.4 m; fine flint-chalk gravel at base; sharp contact with underlying beds ... up to 1.4

Glacial Laminated Sediments

Pale brown and fawn, very evenly laminated silty clay and clayey silt with some thin beds of yellow fine-grained clayey sand. ... 1.8

Varicoloured, fine-grained, well-sorted sand with ill-defined, less even bedding than above; a few clay laminae; sharp base ... 1.3 - 2.0

Glacial Sand and Gravel

Mainly very coarse, crudely bedded, very poorly sorted, flint-rich gravel; many large cobbles in excess of 0.2 m across; pebbles of quartz and quartzite are subordinate, and chalky gravel is restricted to isolated patches; scattered ironstone and sandstone pebbles, and rare igneous rocks; some beds and lenses of finer, better sorted gravel and coarse, pebbly, cross-bedded sand, the latter locally with abundant chalk grains; cross-bedded units have foresets dipping at up to 30°; at the eastern end of the pit a 0.5 m thick lens of chalky boulder clay lies just above the base of the gravels; gravel at base fills channels cut into the underlying sands ... up to 6.0m

Norwich Crag

Pale yellow and bright orange, medium- to coarse-grained, well-sorted, well-rounded, slightly micaceous, bedded sands with a few thin bands of well-rounded flint pebbles and rare clay laminae; the pebble layers coalesce in the eastern face into a thick lens of mature flint shingle. In this face the Norwich Crag is penetrated by i) a channel filled with chalky boulder clay and ii) a channel filled with buff loamy clay containing scattered flint and quartz pebbles, and strings and lenses of fine chalky gravel; this deposit is bedded in part (probably corresponds to the Starston Till Member of the Beccles Formation). ... 3.0 seen

Old gravel pit (2060 9479)

Glacial Sand and Gravel

Orange medium- to coarse-grained, loamy, gravelly sand with large flint nodules at the base ... 1.2-1.8m

Coarse, moderately well-sorted, sandy gravel with many flint pebbles and cobbles; subordinate quartz and quartzite pebbles and nodular flints ... 0.6

Old gravel pit [2138 9482]

Glacial Sand and Gravel

Coarse, unsorted, sandy gravel mainly composed of white-patinated nodular flints; some tabular flints and quartzite pebbles; a medium gravel component of sub-angular flints ... 1.2

Old gravel pit, Hempnall [2414 9465]

Glacial Sand and Gravel

Coarse, dense, poorly sorted flint gravel with a coarse gritty sand or fine gravel matrix; fills channels cut into the underlying sand but only slightly into the lower gravel ... 0.3-1.2m

Coarse, moderately well-sorted, rusty-brown, bedded sand with a few scattered small flint pebbles and angular flints ... 0 - 0.7m

Very coarse, unsorted, flint-rich gravel with abundant nodular flints (up to 0.25 m across) and some flint cobbles in a matrix of medium gravel and coarse gritty sand; many chalk pebbles and a few quartzites; rare ironstone pebbles ... 1.7-2.0m

Coarse gravel, as above, but very ferruginous and with a black-stained layer at the top, and no chalk ... 1.7m seen

Section in south bank of R. Tas, Hempnall [2408 9438]

Alluvium

Peat ... 0.15

Coarse, gritty, clean quartz sand ... 0.05

Dark grey, very sandy organic clay with scattered black angular and rounded flint pebbles ... 0.30

Fine sandy gravel, mainly of angular flints in a coarse sand matrix ... 0.20

Coarse unsorted flint-rich gravel ... 0.20

Old gravel pit [2471 9443]

Glacial Sand and Gravel

Coarse sandy gravel, mainly of large nodular flints and flint cobbles; also angular flints

and quartz and chalk pebbles ... 2.0

Crudely bedded, sandy, medium flint gravel with some chalk pebbles and sandy lenses ... 1.8

TM 29 SE

Old sand pit at Fox Burrows (c 295 937) - composite section

First Terrace

Coarse, poorly sorted, moderately well-rounded gravel, mainly of nodular flints (cobbles up to 0.15 m across) but with some quartz and quartzite pebbles; coarse gritty sand matrix ... 1.0

Beccles Formation

Pale orange and yellowish brown, medium-grained, well-sorted, slightly micaceous, laminated and ripple-drift bedded sands with a few grey or dark brown clay and silt laminae; some well-rounded flint-quartz-quartzite gravel near the top ... 3.5

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