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Archaeological Field Unit

**Roman Car Dyke Canal at Denny Industrial Centre:  
An Archaeological Evaluation**

Spencer Cooper

2000

**Cambridgeshire County Council**

Report No. A167

*Commissioned by APT (on behalf of One to One)*

# **Roman Car Dyke Canal at Denny Industrial Centre: An Archaeological Evaluation**

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## *SUMMARY*

*On the 2<sup>nd</sup> of October 2000, an archaeological evaluation was undertaken on land at Denny Industrial Centre, Waterbeach (TL 5488 2658), by staff of the Cambridgeshire County Council Archaeological Field Unit. The work was carried out in advance of the proposed construction of a telecommunications monopole.*

*A single trench was excavated across the development site, which revealed buried deposits within a large ditch, presumed to be the Roman Car Dyke canal. The deposits were encountered at a depth of c1m extending to at least 3.5m below modern ground level and were sealed by later post-medieval layers. The post-medieval deposits may relate to the 17<sup>th</sup> century when the dyke was re-cut for use as a drain or a catch water, and these were sealed by modern infill. The evaluation appears to confirm that the presumed route of the Car Dyke canal does follow the route of the A10 and Beech Ditch at this point, however medieval or post-medieval activity may have removed Roman deposits at this point.*

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# **Roman Car Dyke Canal at Denny Industrial Centre: An Archaeological Evaluation.**

## **1 INTRODUCTION**

On the 2<sup>nd</sup> of October 2000 the Archaeological Field Unit of Cambridgeshire County Council carried out an archaeological evaluation on land at the Parker Steel site in the Denny Industrial Centre Waterbeach (TL 5488 2658) before the proposed construction of a telecommunications monopole. The work was commissioned by A.P.T on behalf of One to One. The evaluation was undertaken in accordance with the Project Specification (SEP 045/00) drawn up by Stephen Macaulay in response to a Design Brief issued by Andy Thomas of the County Archaeology Office.

## **2 TOPOGRAPHY AND GEOLOGY**

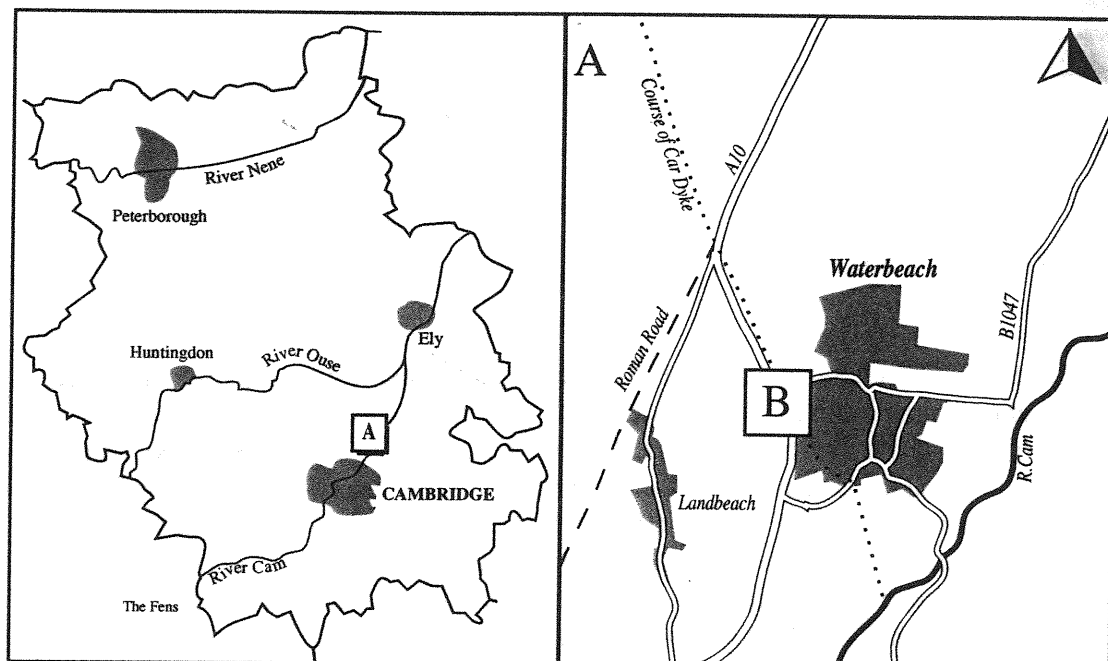
The development area is situated to the northwest of Waterbeach on Second Terrace river gravels deposits overlain by alluvium.

The site lies to the west of the Denny Industrial Centre, immediately to the east of the modern A10 which is west of the historic village of Waterbeach and south of the Waterbeach Barracks. The site is directly on the proposed route of the Car Dyke Roman Canal, in an area of high archaeological potential. Immediately adjacent to the proposed development area is the large Beech Ditch, parts of this feature appear to follow the course of the Car Dyke canal. However the Car Dyke was over 22m wide and 4m deep and therefore much broader than the modern ditch (Macaulay & Reynolds 1994, Macaulay 1997).

## **3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND**

### **General Background**

The Cambridgeshire Sites and Monuments Records identifies the key archaeological remains likely to be encountered as the Car Dyke Roman Canal (SMR No05349). The Car Dyke is a Scheduled Ancient Monument (SAM No: 3) and is well preserved in the sections around Waterbeach. Excavations carried in the 1990s have demonstrated good preservation of buried deposits (Macaulay & Reynolds 1994, Macaulay 1997 & Macaulay forthcoming) including complete sequences of construction, bank materials and primary



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**Figure 1** Site location

infilling episodes. Furthermore Horningsea type kilns and large quantities of Hadrianic (AD 118-138) and Antonine (AD 138-161) pottery were recovered. Car Dyke is the name given to a series of Roman earthworks and cropmarks which run in an interrupted line from the River Cam at Waterbeach to the River Witham near Lincoln. It has two main sections which connect natural watercourses to form a continuous route, although there is debate as to whether all the 'Car Dyke' is a single monument or a series of locally important features and what its purpose was. It has been known to historians since Stukeley identified it in 1757. He interpreted it as a military canal to supply the army in Lincoln and York with cereals produced in the south. An alternative explanation for it is that it acted as a catch-water (Fox 1923; Hall 1985; Pryor 1978; Simmons 1975, 1979) and was an essential part of the drainage works undertaken by the Romans to produce an Imperial estate in the fens in the second century AD (Astbury 1958; Phillips 1970).

The monument runs some 122 km in length and has 10 scheduled sections totalling 33 km. It comprises a major channel of varying size and profile with banks which can occur on either or both sides. There are occasional gaps in the banks and in some places causeways appear to have been constructed across the channel. The monument is in varying states of preservation having suffered from infilling, ploughing, re-cutting and dredging. Roman artefact scatters occur in many places along the route and post-Roman/Anglo-Saxon remains are particularly well associated with the monument at its junction with the Cam at Waterbeach. Its construction and subsequent decay have had a profound effect on both drainage and transport along the fen edge, thus affecting the local development of these areas in later times. The monument has been used to define parish boundaries.

The route is well described elsewhere (Fowler 1932; Astbury 1958; Phillips 1970; Simmons 1975; Wilkes and Elrington 1978) and so will not be discussed in length here. There are two main sections of earthwork/cropmark: the southernmost running between the River Cam at Waterbeach and the Ouse at Earith, and the northern one running from the River Nene at Horsey (southeast of Peterborough) to the River Witham near Lincoln. There is a major gap in the route between the Earith and Horsey, and Astbury (1958) suggests that the missing section is 'lost' to a more modern waterway such as Conquest Lode or Whittlesea Dyke, whilst Cnut's Dyke is also a possibility. However, recent survey work has failed to locate such a watercourse (Hall and Coles 1994) and it is suggested that the main river systems of the Ouse and Nene were used for transport instead of an artificial water course through the Fens.

The southern section of Car Dyke can be seen to run from the Cam south of Waterbeach to join the Old West River at Lockspit Hall, north-east of Cottenham. It continues westwards by making use of the Old West along which many Roman finds have been identified until this tributary joined the Ouse at Earith (Fowler 1932; Phillips 1970). To the east of Lockspit Hall the present course of the river (called the "Old West" or "Ouse") appears to be a late Post-Roman natural cut through dry land to join with the River Cam east

of Stretham and thence together flowed north around the east of the isle of Ely (Fowler 1933; Worssam 1969).

Excavations at Bullock's Haste, Cottenham (Clark 1949) yielded Belgic pottery sealed beneath one of the banks of the Car Dyke. These finds have been used to suggest a date of AD 50-60 for construction of the Dyke, while later first century pottery recovered from the basal silt of the channel could support this, but Hartley suggests this typological dating may need review in the light of more recent finds (Philips 1970).

Excavations at Waterbeach undertaken by the Archaeological Field Unit of Cambridgeshire County Council in April 1993 (as part of the Cambridgeshire County Farms Survey) did not recover information pertaining to the construction of the monument, however large quantities of Antonine pottery (AD 140-180) were discovered (obtained from a single section). These artefacts were recovered from the basal fills of the canal, although later layers had been lost through truncation during 17<sup>th</sup> century drainage works. The results suggest that the canal may have been falling into disuse at this time, although this may be prior to the actual abandonment of the monument.

It has been suggested that the suppression of the Boudiccan revolt of AD 60-61 will have produced population movements into the fen area and also provided labour for the construction of works like Car Dyke (Phillips 1970; Potter 1965 and Pryor 1978). This would fit with the evidence of pottery from Clark's excavations. However, evidence for initial occupation of the silt fen in Lincolnshire is mostly from the first half of the second century AD and excavations at Romano-British settlements near Car Dyke at Earith span the period from the first to the fourth centuries AD (White 1967). Pottery finds from later deposits dredged up from the channel of the Car Dyke at Bullocks Haste (Cottenham) broadly span these periods.

Car Dyke was certainly blocked at Cottenham after AD 375 for pottery of this date was found in a causeway deliberately constructed across the Dyke at Bullock's Haste (Clark 1949). Tebbutt (1957) however quotes Clark's data but suggests Car Dyke was abandoned at the end of the second century. The significance of the causeway for indicating the disuse of the canal is not clear. From constructional details observed by Simmons (1979) at a section of the Dyke in Lincolnshire causeways were always present, formed by leaving an upstanding baulk of natural gravel whilst digging out the Dyke channel. This is confirmed by later work (Thorpe and Zeffertt 1989).

Excavations by Lethbridge at Waterbeach in 1927 show the presence of Anglo-Saxon grubenhaus near to the Dyke, and that Anglo-Saxon pottery was discovered in the upper fills of the, by then, silted up Car Dyke. Pottery from this site included unabraded Romano-British sherds and it seems that this site is very early Anglo-Saxon. Hall (pers comm) suggests that the Old West to the south of the Isle of Ely was formed in the wetter environment of later Anglo-Saxon times, or most likely, during the medieval period.



A channel running from the centre of the medieval village of Cottenham links with the route of Car Dyke and its suggested use was to bring building stone to the village (Ravensdale 1974). This suggests that at least one stretch of the Dyke was functioning as a route way into the medieval period or that the wetter conditions during the medieval period allowed Car Dyke to be re-used.

It seems that each part of Car Dyke has its own late Roman and later history, with some stretches remaining as dykes whilst others infilled.

There are two principal suggestions as to the function of the Car Dyke, and they are notable in that they reflect the geography of the worker's interest. The Southern Car Dyke, from the Cam to the Old West River and on to Earith has been interpreted as a logistical route for the Roman army linking up two of the major rivers of the region, and so create an access to the north (Fox 1923; Fowler 1932). Fowler states there was no Old West river between Stretham and Lockspit Hall, so Car Dyke formed the only link. In the Lincolnshire section the prevailing interpretation has been that the Dyke served as a catch-water, diverting the seasonal increase in run-off into the nearest watercourses and preventing flooding in the Fenland (Simmons 1975). This is seen as a necessary part of the maintenance of the saltern industry which developed on the silt fen edge during the second century especially in Lincolnshire (Philips 1970). Both interpretations have been applied to the other respective part of the Car Dyke and also to other Roman waterways in the Fenland region (Potter 1966).

It is clear that neither interpretation has been as yet adequately refuted, although the recent sections excavated in Lincolnshire would emphasise the catch-water nature of the channel in that area, especially given the causeways blocking the route. Assuming Car Dyke had a transport function, the main suggestions for the goods transported upon it is corn (Darby 1983; Fox 1923) and building stone (Wilkes and Elrington 1978), but pottery is also likely to have been transported (a number of canal side kilns have been recorded), as would salted meat and the hides from animals slaughtered for transport. Dewhurst (1964) even suggests coal would have been imported from Nottingham and Derby along it, following the most logical route, although there is little definite evidence to support this theory.

The dimensions of Car Dyke, where known, are compatible with a transport function, if boats and barges such as those known from the Thames were being used (Mansfield 1966; Milne 1985; Wheeler 1950). In Cambridgeshire, excavation at Bullock's Haste (Clark 1949) and Earith (White 1967) and dredging of the channel has produced rich collections of pottery lacking in Lincolnshire (Philips 1970; Simmons 1975, 1979; Thorpe and Zeffertt 1989). There is also a notable association of kilns with the southern section of the Dyke (Cambridgeshire County Council SMR; Walker 1912; Swan 1984) and another interesting association is a large number of querns found in fields along this part of it. These circumstantial pieces of evidence would seem to support an interpretation of the southern section of Car Dyke being that of a canal for transporting grain, flour and pottery.

The 1993 excavation (Macaulay & Reynolds 1994) supports the interpretation of the Car Dyke as canal. The dimensions of the canal (22m wide and 4m deep), being broad and flat bottomed suggest a transport function. Similarly the high quantities of pottery combined with environmental data, suggest that the function and disuse of the monument was linked to transport. Environmental data (pollen analysis) indicated that the disuse of the Car Dyke was connected to changes in the local agricultural regime.

The most recent excavations in 1997, at Clayhithe, Horningsea, (immediately southeast of Waterbeach) where the Car Dyke meets the River Cam, produced exceptional results. Outside of the Roman towns of Cambridge, Godmanchester and Durobrivae (Water Newton near Peterborough) the area north of Cambridge, close to Milton, Landbeach, Horningsea and Waterbeach contains some of the most concentrated Roman archaeology in Cambridgeshire. The sites at Waterbeach contains a representative sample of much of this activity. For the first time a section of the Car Dyke was investigated where it connects with a natural waterway (River Cam). At Clayhithe there was clear evidence of a direct connection. It was also likely that a lock must have existed, most probably further north, possibly beyond the modern railway line. The section of Car Dyke excavated in 1997 contained some of the best undisturbed deposits, much of which were waterlogged, of any stretch of canal yet observed (Macaulay forthcoming). Excavation data has provided dates for the construction (Hadrianic early 2<sup>nd</sup> century AD), main use (2<sup>nd</sup>-3<sup>rd</sup> century AD) and disuse (early 4<sup>th</sup> century AD) of the canal, and a full palaeoenvironmental sequence of the same periods. This information no longer survives in deposits immediately north of the railway line (Macaulay & Reynolds 1994). The investigation also confirmed that the area north of the River Cam was also an intensive area of pottery production for the Horningsea pottery industry. The location of the kiln(s) on the bank of the Car Dyke at its junction with the river confirms the transport function of the monument. A large Roman building, linked to the Car Dyke and acting as a warehouse/industrial, was also investigated.

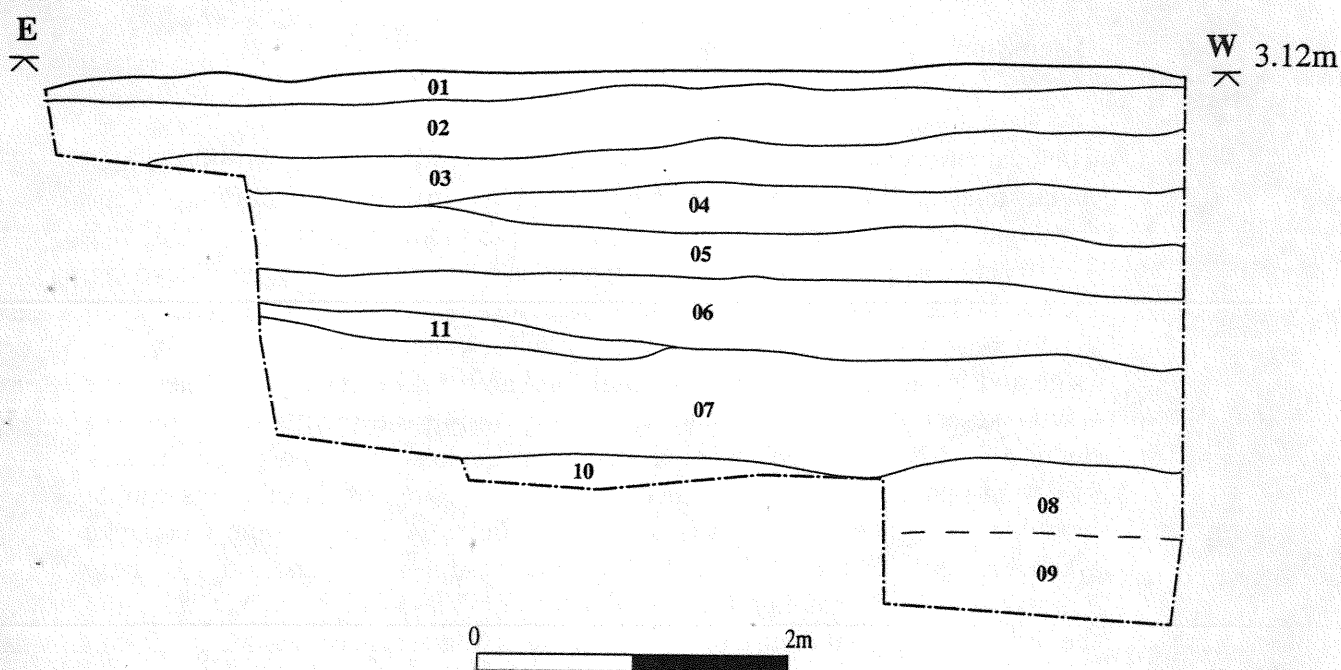
#### 4 Methodology

Following background and documentary study a trench 7m long and 1.6m wide was excavated using a wheeled JCB with a toothless bucket. A total of 8% of development area was evaluated. The location of the trench is shown in Figure 1. After machining the trench was photographed and recorded using the AFU standard archaeological recording system. The spoil heap was scanned for artefact retrieval. The trench was stepped to follow safety procedures.

## 5 Results (See figure 2)

### General

The evaluation revealed a series of deposits (5, 6, 7, 8, 9, 10 & 11) which represent the infilling and flooding of the Car Dyke canal. No artefactual material was recovered from any of the earlier deposits. These earlier fills were sealed by post-medieval deposit (4). This post-medieval deposits may relate to the 17<sup>th</sup> century when the dyke was re-cut for use as a drain or a catch water, which would eventually become the Beech ditch. The post-medieval deposits were sealed by modern deposits (1, 2 & 3) that have filled the Dyke in the last 50 years. Presumably during the construction of the nearby industrial centre.



**Figure 2 Section**

The trench was 7m long and 3.50 metres deep, excavated broadly on a northeast-southwest alignment, positioned to cut across the probable route of the canal. The earliest deposit within the stratigraphic sequence 9, consisted of dark grey clay silt, which was 0.50m deep, recorded 3.50m below the modern ground surface. No artefacts were recorded from this deposit. Sealing this, was fill 8, a dark grey clay silt which was also 0.50m deep. Above 8, was fill 10, which was a light grey silt, 0.20m deep and above 10, was fill 7, a brownish grey silty clay 0.70m deep. No artefacts were recovered from this deposit. These deposits represent infilling of the Car Dyke canal perhaps during the Romano-British period, however the absence of artefactual



material leaves this assumption open to question. Fill 7 was sealed by context 11, which was a light grey sandy silt and was 0.10m deep. Again no artefacts were recovered within this context. Fill 6 consisted of a brown silty sand which was 0.25m deep. Fill 6 was sealed by fill 5. Fill 5 comprised of an orange brown sand which was 0.20m deep. No artefacts were recovered. This context appears to represent the latest potential Roman deposit of the Car Dyke within this sequence and lay c1m below modern ground level. Overlying this was fill 4, a light grey silty sand with occasional fragments of post-medieval brick. Sealing this was fill 3 which consisted of a grey silty sand 0.20m deep. A considerable amount of modern demolition material was observed within this context. The subsoil horizon 2, was composed of a dark grey silty clay and was 0.45m deep. Layer 1 is modern topsoil, a dark grey silty clay which was 0.15m deep.

## **6 Discussion**

The evaluation has revealed at least three phases of deposition within the area under investigation. The earliest phase represent infilling and flooding of the Car Dyke canal presumably in the Roman period (fills 5, 6, 7, 8, 9, 10 & 11). The absence of pottery, or any other material to accurately date these deposits, means the Roman date is hypothetical and a later date (for example medieval) cannot be discounted. However these fills have accumulated within a very large and broad ditch, which was in all probability the Car Dyke canal. The Car Dyke canal was in existence as a ditch during the medieval period (see Section 3 above Archaeological & Historical Background) and given the lack of dating material recovered a medieval date for some of these layers cannot be ruled out. The deepest fills may be medieval infilling of the Car Dyke when the feature presumably acted as a drain during this period. If these deposits are Roman in date they are likely to be late 3<sup>rd</sup> century AD matching the dates for the final disuse of the Car Dyke at Waterbeach (Macaulay 1997).

The second phase, identified in the evaluation, was post-medieval deposit (4), which may relate to the re-use of the dyke in the 17<sup>th</sup> century. The third phase is characterised by modern deposits (1, 2 & 3). Fill 3 contained demolition material which may relate to the construction of the nearby Industrial Estate in the late 20<sup>th</sup> century.

## **7 Conclusions**

The evaluation has demonstrated that possible Roman deposits (clearly earlier than post-medieval) were encountered at a depth of c.1m below the modern ground surface, although no artefactual material was recovered to date these. Furthermore there was no trace of any bank construction or primary infilling because the evaluation trench must have been placed over a central part of the



ditch. Previous excavated sections of the canal to the south of the subject site in Waterbeach and Clayhithe (Macaulay & Reynolds 1994, Macaulay 1997) have produced pottery from basal and lower fills, however the upper layers have not produced much artefactual material and this may be similar to what has been observed during the recent evaluation. The depth of the deposits encountered clearly indicate that the evaluation trench was within a very deep and broad feature, almost certainly the Car Dyke canal itself. The base of the evaluation trench was over 3.50m below the modern ground surface (-0.38m OD) and natural (second terrace) gravels should have been exposed at such a depth, however, these were not present.

It is important to also note at this point that the height of the lowest fill encountered in the evaluation (-0.38m OD) is over 2m *lower* than the base of the Car Dyke to the south in Waterbeach (1.5m OD Macaulay & Reynolds 1994). Given that the deposits go even deeper this discrepancy is quite significant. The bases of the canal at Clayhithe (Macaulay 1997) and Cottenham (Clark 1947) were both c1m OD. Thus it might be possible that the depth of the fills encountered during the present evaluation are the result of medieval re-cutting and digging within the Car Dyke ditch, the result of which was to entirely remove the earlier Roman deposits. The local topography at this location is lower than the land at Cottenham and Waterbeach, so the difference in heights may be, in part, due to this factor.

If the deposits are correctly interpreted as infilling episodes of the Car Dyke, then the evaluation has demonstrated that the canal does run along the route of the Beech ditch and A10 at this point, a theory long suggested but not proven. Later activity, however, may have removed any Roman deposits within the canal, leaving only evidence for the route itself.

### **Acknowledgements**

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## Appendix A

### Context list

01	topsoil, 0.15cm deep
02	dark grey silty clay, 0.45cm deep
03	grey silty sand, 0.20m deep
04	light grey silty sand, 0.10cm deep.
05	orange brown silty sandy, 0.25m deep
06	brown silty sand, 0.30m deep
07	brownish grey silty clay, 0.70m deep.
08	dark grey clay silt. 0.50m deep.
09	dark grey clay silt. 0.50m deep.
10	light grey silt 0.20m deep
11	light grey sandy silt 0.10m



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