BEDFORD WATER MAIN
Queens Park (Bedford) to west of Cemetery Road (Kempston Rural)

RESULTS OF ARCHAEOLOGICAL INVESTIGATION

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Preface

Every effort has been made in the preparation of this document to provide as complete an assessment as possible, within the terms of the specification. All statements and opinions in this document are offered in good faith. Albion Archaeology cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party, or for any loss or other consequence arising from decisions or actions made upon the basis of facts or opinions expressed in this document.

Acknowledgments

This report has been prepared by Mike Luke (Project Manager) and Jackie Wells (Finds Officer), with illustrations by Joan Lightning (CAD supervisor).

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Non-technical summary

Due to extensive new residential development to the west of Bedford a new water main was required. The route of the water main started in Allen Park Recreation Ground (Queens Park) and terminated to the west of Cemetery Road (Kempston Rural). It passed through land within the Biddenham Loop and near Kempston Church End, areas which are known to contain extensive archaeological remains.

Albion Archaeology undertook archaeological investigations in advance of construction in line with the approved Written Scheme of Investigation (Albion 2008a). Due to a variety of landowner and programme issues the pipe, and therefore the archaeological investigations, were undertaken in several stages between September 2008 and June 2011. This report presents the results of all stages of investigation.

Evidence was recovered for activity in nearly all significant periods of British prehistory and history. The dating and interpretation of these features is heavily dependant on the results of previous investigations on adjacent land, especially those undertaken in advance of the David Wilson Homes residential development and the Bedford Western Bypass. The results can be summarised as follows

- ***Late Neolithic/early Bronze Age-*** *two small pits on the Biddenham Loop*
- ***Middle Bronze Age-*** *several ditches which defined fields on the Biddenham Loop*
- ***Late Bronze Age-early Iron Age-*** *part of a pit alignment that crosses the Biddenham Loop*
- ***Middle Iron Age-*** *a single possible storage pit towards the south of the Biddenham Loop*
- ***Romano-British-*** *northern boundary ditches associated with a farmstead (NE of the Biddenham Loop); trackway and domestic activity associated with another farmstead (south of the Biddenham Loop); and boundaries, pits and a cremation burial on the periphery of the roadside settlement (near Kempston Church End)*
- ***Saxo-Norman-*** *boundary ditches and two possible buildings associated with a previously unidentified settlement in Queens Park area of Bedford*
- ***Early medieval-*** *boundary ditches and pits associated with a previously unidentified settlement in Queens Park area of Bedford*
- ***Post-medieval-*** *quarry pits and ditches to the NE of the Biddenham Loop*
- ***Undated-*** *possible ditches or pits to the SW of Cemetery Road*

The results are significant and worthy of publication but a stand-alone article would not enable them to be put into a meaningful landscape context. Therefore, the results of the water main investigations will be fully integrated into the combined analysis and publication of the David Wilson Homes and Bedford Western Bypass projects.

1. INTRODUCTION

1.1 Project background

Anglian Water designed a water main to provide water supplies for new residential developments to the west of Bedford. The archaeological officer of Bedford Borough Council indicated that the route passed through an area of archaeological significance.

1.2 Status and purpose of this document

This document presents the results of all the archaeological investigations associated with construction of the Bedford Water Main between Allen Park (Queens Park) and just west of Cemetery Road (Kempston Rural).

Details of the archaeological background, investigation strategy and methodology are fully described in three documents:

- Written Scheme of Investigation (Albion 2008a)
- Bedford Water Main, Biddenham Loop Phase 1: Results of archaeological investigations (Albion 2008c)
- Update on route and areas requiring archaeological investigations (Albion 2010a)

These are not, therefore, repeated in detail within this document.

1.3 Archaeological background

The Biddenham Loop represents an area of intense past human activity from the early Neolithic, with significant activity known to survive from the early Bronze Age, middle Bronze Age, late Bronze Age/early Iron Age, middle Iron Age, and late Iron Age/Romano-British and early Saxon period (Albion 2008b). Few archaeological discoveries have been reported in the Queens Park area of Bedford, although two Bronze Age ring ditches are known from aerial photographs to exist within 70m of the route. To the south of the River Great Ouse an extensive Roman settlement is known to have existed around the modern hamlet of Kempston Church End.

1.4 Pipeline route and ground conditions

The pipeline route commences at TL0313/4934 in Allen Park Recreation Ground (Queens Park area of Bedford), crosses the Biddenham Loop (an area of land that lies within a large meander of the River Great Ouse to the south of the village of Biddenham), passes under the floodplain of the river and terminates at TL0137/4756 to the south of Cemetery Road, Kempston (Figure 1).

The route passes through playing fields, allotments, development land, and areas allocated for country park. The working corridor was marked out in advance and cleared of obstacles prior to the mechanical stripping of overburden.

Where possible the route was amended to avoid significant known archaeological remains, e.g. a Bronze Age ring ditch monument at the south of the Biddenham Loop (Albion 2008a, fig. 3). In addition, the length of directional drill under the River Great Ouse was extended to continue under the majority of the Kempston Church End Roman settlement (Albion 2010, fig. 5).

1.5 Topography and geology

The topography of the route is generally flat, although it slopes down towards the floodplain of the River Great Ouse. The majority of the Biddenham Loop lies at approximately 30-33m OD with its highest point being at 41m OD in the north-east. A large stretch of the route is within the floodplain of the River Great Ouse which lies at approximately 28m OD.

The underlying solid geology of the area is limestone, but this is overlain by river gravels (within most of the route) and alluvium (closer to the present-day river). Occasional outcrops of Oolitic Limestone and Cornbrash Limestone, separated in places by Blisworth Clay, are known. Above the Cornbrash are the clays and sands of the Kellaway Beds, sealed by a layer of dark grey Oxford Clay.

1.6 Method statement

The archaeological investigations were undertaken in accordance with the Written Scheme of Archaeological Investigation (Albion 2008a). This approach is compatible with that taken on the adjacent David Wilson Homes land (CgMs 2007; Albion 2007). These documents contain detailed methodologies.

The investigation methodology can be summarised as follows:

- All machine excavation was undertaken using a 360˚ mechanical excavator fitted with a toothless bucket operated by a Balfour Beatty driver.
- In areas which had not been previously investigated, topsoil and subsoil were removed to the width required to provide a working corridor. Mechanical excavation ceased when the top of archaeological deposits, clean natural gravel deposits, or backfill from the recent investigations were visible.
- The stripped width was variable depending on the amount of overburden and storage space available.
- All overburden was stored within the working corridor.
- The spoil heaps and archaeological features were scanned for artefacts.
- Different archaeological recording number sequences were used for the different areas of investigation, e.g. Allen Park = contexts 400s, west of Cemetery Road = 500s etc.
- Where it was possible that multiple segments would be dug through ditches a general number and a segment number were issued. Unless otherwise stated in this report all numbers used for ditches are general numbers

1.7 The investigations

Due to a variety of landowner and programme issues the pipe, and therefore the archaeological investigations, were undertaken in several stages. These comprised:

- **September 2008**- a *c.* 500m length to the NE of the Biddenham Loop was undertaken several years ahead of the main pipe to avoid a potential clash between laying the pipe and imminent house building.
- **October 2010**- a *c.* 1km length to the south of the above section which crossed the Biddenham Loop from NE to SW with archaeological work ceasing at the Bedford Western Bypass which had already been investigated.

- **November 2010-** a 315m length through the Allen Park Recreation Ground and adjacent allotments.
- **November 2010-** two machine pits for directional drill machinery to the east of Cemetery Road, Kempston Rural.
- **February 2011-** a *c.*100m length of narrow trench to the east of Cemetery Road, Kempston Rural for a temporary connection to the existing water main.
- **June 2011-** a *c.* 40m length adjacent to Cemetery Road on the west side and a machine pit for directional drill machinery to the south-west of Cemetery Road, Kempston Rural.

2. RESULTS

2.1 Introduction

Archaeological remains were discovered and investigated in all parts of the pipe corridor. All features and artefacts were found within a narrow investigation area corresponding to the working corridor and therefore the interpretation of these remains is largely dependant on the results of adjacent investigations.

2.2 Description by chronological period

The archaeological features are described below by chronological period and within geographical area where appropriate. Unless otherwise stated, feature numbers given are the general numbers for ditch lengths rather than for actual segments (both are shown on the all-feature figures).

2.2.1 Late Neolithic/early Bronze Age

A small pit [48] was located to the NE of the Biddenham Loop (Figure 3). It was circular, *c*. 1m in diameter and *c*. 0.35m deep. As such, it was similar to other isolated pits found within the DWH investigations dated to the late Neolithic/early Bronze Age. Despite being fully excavated it contained no artefacts.

A similar small pit [178] was located to the south of the Biddenham Loop (Figure 6) and may be contemporary. It too did not contain any datable finds.

2.2.2 Middle Bronze Age

A number of ditches, likely to have defined fields, were discovered within the Biddenham Loop. None of those investigated within the water main produced datable artefacts. Some have been assigned to this period because they pre-date Roman ditches, but for the majority it is because they share the same alignment as middle Bronze Age field boundaries found in adjacent investigations.

To the NE of the Biddenham Loop two ditches [4] and [59] were identified *c.* 150m apart, corresponding to ditches found in the DWH investigations (Figure 3). Both were under 0.9m wide and 0.4m deep.

Five ditches were discovered in the main part of the Biddenham Loop. From north to south, four were aligned SE-NW [215, 192, 194, 193] and one was aligned NE-SW [196]. All were under 0.8m wide and 0.4m deep. Ditch [193] is the only one that does not correspond with middle Bronze Age ditches found in adjacent investigations. It was, however, parallel to and only *c.* 2.5m from ditch [194], so is clearly contemporary. Ditches [193] and [196] appeared to stop within the stripped corridor but their shallow depth suggests that they are more likely to be truncated rather than terminating.

Two ditches [138 and 140] at the southern part of the Biddenham Loop were on a slightly different alignment to the other ditches in this area; they were also stratigraphically earlier than Romano-British ditches (Figure 6). Ditch [140] contained a fragment of animal bone. Ditch [138] also produced a fragment of animal bone and a small sherd of

Romano-British pottery. The latter is considered to be intrusive given the extent of activity of this period in this area.

To the NE of the Biddenham Loop an E-W alignment of 13 postholes [40] to [36] was identified directly to the east of middle Bronze Age ditch [4] (Figure 3). They were 0.2–0.6m in diameter and 0.4m deep. The alignment was approximately 21m long. No datable artefacts were recovered from the postholes but similar alignments of postholes within the Biddenham Loop have been assigned to the middle Bronze Age. Two more postholes [6] and [10] were located 6m to the north of the posthole alignment.

2.2.3 Late Bronze Age/early Iron Age

Three adjacent pits [213, 210, 206] were located within the main part of the Biddenham Loop (Figure 4). They are part of an E-W pit alignment which extends for *c.* 1km across the Loop. At 2.5m in diameter and 1m deep they were similar to the pits investigated within the Bovis, Western Bypass and David Wilson Homes projects. The upper fill of pit [210] produced a sherd of Romano-British pottery. Good dating evidence from the other investigations indicates that this pit alignment was constructed in the late Bronze Age/early Iron Age.

2.2.4 Middle Iron Age

A single pit [159] was located to the south of the Biddenham Loop (Figure 6). It was *c.* 2.5m in diameter and 0.5m deep. Its fills contained no finds. However, it was similar in dimensions and profile to middle Iron Age storage pits located *c.* 30m away within the DWH investigations and is likely to date to this period.

2.2.5 Romano-British

Several areas contained archaeological remains of this period.

2.2.5.1 Allen Park

A relatively large number of parallel ditches were located in the Allen Park area (Figure 2). Unfortunately, only a few contained datable pottery and this was early medieval in date. It is possible that some of these features represent peripheral field boundaries associated with the known Romano-British farmstead in the NE of the Loop. However, these ditches are described in more detail under the early medieval section.

2.2.5.2 North-east Biddenham Loop

Two ditches of this period were identified in this area (Figure 3). Ditch [50] was the continuation of a major N-S boundary ditch intensively excavated within both the DWH and Bovis investigations. The ditch was 2.8m wide and 0.9m deep with a U-shaped profile. No finds were recovered. It is likely that this ditch is part of the western boundary of a farmstead located within the DWH investigation area. Cropmark evidence suggests that *c.* 10m to the north of the stripped corridor it turns to the east and forms the northern boundary of the same farmstead.

Ditch [57] was much smaller at *c.* 1.1m wide and 0.55m deep. It was aligned E-W but turned southwards and was clearly the continuation of one of the Romano-British ditches found in the DWH investigations to the south. This was confirmed by the presence of 0.2kg of Romano-British pottery.

2.2.5.3 South Biddenham Loop

Evidence for a Romano-British settlement and trackway was located in the southern part of the Biddenham Loop (Figure 5 and Figure 6). It comprised ditches, pits and a possible structural gully. These features produced 4kg pottery, three fragments of roof tile, an iron strap (RA101), five iron nails and 0.5kg animal bone. Some of the ditches located within the corridor correspond with cropmarks, geophysical anomalies and features found within the DWH investigations. This activity is located near a known farmstead partly examined in advance of the Bedford Western Bypass.

The main trackway ditches [107] and [130] were *c.* 9m apart. Both were *c.* 2m wide and 0.6m deep. Western ditch [107] produced *c.* 3.5kg of pottery and eastern ditch [130] 0.3kg of pottery. Ditch [128], *c.* 2.5m to the east and parallel to ditch [130], is presumed to be associated with the trackway, although it produced no dating evidence.

Approximately 15m to the west of the trackway was another parallel ditch [144]. It was *c.* 1.1m wide and 0.8m deep. It was a recut of ditch [142] which, although truncated, may have originally had similar dimensions. Ditch [142] terminated within the stripped corridor suggesting the presence of an entranceway at least 6m wide. These ditches produced *c.* 0.3kg of pottery and smaller quantities of roof tile.

Another ditch [146] was perpendicular to the trackway and terminated before it reached ditches [142]/[144] suggesting all are contemporary. It produced smaller quantities of pottery and four iron nails.

Adjacent to the terminal of ditch [142] were a number of pits [165, 168, 172, 174, 176]. They varied in dimensions from 2m x 1m to 0.7m x 0.6m and were all under 0.7m deep. It is uncertain if all the pits were contemporary but [168] was truncated by ditch [142]. They produced moderate quantities of pottery and animal bone.

A curious rectangular arrangement of a gully [132, 134, 136] was identified within the trackway. The gully was under 0.3m wide and 0.1m deep. A number of segments were excavated across it and these produced moderate quantities of pottery, a single iron nail and small quantities of animal bone. Its alignment would suggest it was not contemporary with the trackway, although it could have formed some kind of movement control structure within it.

2.2.5.4 East of Cemetery Road

An extensive Romano-British settlement is known to exist between Cemetery Road and the River Great Ouse (approximately centred on the modern hamlet of Kempston Church End). The water main was directionally drilled underneath the majority of the settlement from a point *c.* 20m east of Cemetery Road. In this area the excavation of two machine pits and a narrow pipe trench were observed (Figure 7). These were all located within the former working corridor of the Southern Orbital Sewer which was installed in 1992, but only subject to a partial watching brief.

The western machine pit and the majority of the narrow pipe trench were dug into the backfill of the actual SOS pipe trench so contained no archaeological features. However, to the east of this, although the ground had clearly been disturbed as part of the SOS construction works, a number of features were identified. The level of disturbance

restricted the area available for investigation, e.g. the pipe trench was 0.5m wide and 0.7m deep. The lack of direct access to the trench, due to Health & Safely rules, also made recording and interpretation of the features more difficult — it was especially difficult to determine whether features were pits or ditches. The topsoil in this area produced nearly 100g of Roman pottery.

A NW-SE ditch [316] was identified within the narrow pipe trench. It was probably *c.* 2.2m wide and over 1m deep. Although its fills produced no datable artefacts, its alignment coincides with a linear anomaly identified during a geophysical survey undertaken in April 2011 as part of the Western Bypass analysis project.

In addition, two possible large pits [312] and [324] were identified on either side of ditch [316]. They were over 2.5m in diameter and 1m deep. Both produced sherds of Roman pottery.

2.2.5.5 West of Cemetery Road

Immediately west of Cemetery Road NW-SE ditch [505] was identified (Figure 7). It was *c.* 2m wide, 0.8m deep but produced no finds. However, it was on the same alignment as a ditch dated to the Romano-British period within Western Bypass Area 7, *c.* 12m to the south.

Approximately 2m to the east of the ditch was a badly truncated cremation burial [503]. It was placed in a small circular grave *c.* 0.35m in diameter and under 0.2m deep. The fill contained 20g of human bone and 12 iron objects. The latter comprised fragmentary hobnails (parts of leather shoes) and the remains of seven timber nails. The dimensions of the shanks indicate they are small nails, i.e. not from a coffin. It is possible that they were part of a wooden container for which no other evidence survived.

2.2.6 Late Saxon

Within the Allen Park playing fields/allotments two possible sunken featured buildings (SFB) were identified (Figure 2), indicating the presence of a previously unknown settlement of this period.

SFB [418/420] comprised a sunken area which was sub-rectangular in plan, 2.8m long, 2.1m wide and 0.3m deep. Its fills produced 71g of predominately Romano-British and late Saxon pottery. It also contained a complete knife datable to the late 8th–11th century AD. The building is a "classic" type in use during the Saxon period and is a significant discovery. A second possible SFB [427] was found 0.8m to the south-west. At 1.7m by 1.2m by 0.15m deep it was much smaller. It produced a sherd of late Saxon pottery.

A number of ditches and pits were also found in this area and some may be contemporary with the SFBs. However, only early medieval pottery was found in the few that contained datable artefacts, so they are described below.

2.2.7 Early medieval

A relatively large number of ditches and a smaller number of pits were discovered in the Allen Park playing fields/allotments, indicating the presence of a previously unknown settlement (Figure 2). The majority of the features were devoid of datable artefacts and are assigned to this period because of their proximity to the small number which

produced early medieval pottery. A small number of the undated ditches may have originated in the Romano-British period but because this could not be proved they are all discussed in this section.

Approximately 11 ditches were on broadly N-S alignments; most of them are, therefore, likely to be contemporary. Little can be said about N-S ditches [443], [441], [437], [435] and [433]. All were less than 1m wide, 0.35m deep and produced no datable artefacts. Consideration was given to the possibility that some of the features interpreted as ditches were in fact furrows. However, the fact that they were not evenly spaced and were not on exactly the same alignments makes this unlikely.

At the west end of this area ditches [486] and [488] were *c.* 5m apart, broadly parallel, and may have defined a trackway. Both were under 0.75m wide and 0.25m deep. Approximately 20m to the east, and on a slightly different alignment, was one of the few clearly recut ditches. The original ditch [490] was probably similar in size to its recut [492], which was *c.* 0.65m wide and under 0.15m deep. Ditches [496] and [451] were *c.* 9m apart and broadly parallel so may represent another trackway. However, they differed in size — [496] was 1.2m wide and 0.7m deep and [451] was 2m wide and 0.7m deep. Ditch [451] produced 27g of early medieval pottery along with a small quantity of animal bone.

The only identified E-W ditch [447]/[445] was truncated by N-S ditch [451] which produced early medieval pottery. It is, therefore, possible that the E-W ditch dates to the Saxo-Norman or earlier periods.

Only a small number of pits or postholes were identified. Pit [457] was elliptical in plan, *c*. 3.4m by 2.5m, and 0.95m deep. It produced 151g of early medieval pottery along with a roof tile and some animal bone. Pit [408] was 0.9m in diameter and 0.35m deep; it produced one sherd of early medieval pottery and was adjacent to posthole [410]. The majority of the other pits were situated 5.5m to the east. Pits [453] and [463] had steep sides and were the largest at 1.8m and 2.6m in diameter, 0.3m and 0.8m deep respectively. Neither produced datable artefacts, although they did contain animal bone and fired clay. Pit [463] was truncated by small pit [467] and both of the large pits truncated a possible small pit [455]. None of these contained domestic debris.

2.2.8 Post-medieval

To the north-east of the Biddenham Loop the southern end of the N-S strip contained post-medieval quarry pits (Figure 3). Similar features were encountered in the adjacent DWH investigations where they appeared to have been dug to extract limestone.

2.2.9 Modern

To the north-east of the Biddenham Loop a NNE-SSW aligned ditch was located at the western end of the E-W strip and at the northern end of the N-S strip. This feature is the continuation of a ditch located within the DWH investigations to the south-east and the Bovis investigations to the north (Figure 3). It contained barbed wire and modern china, indicating that it was part of a modern field boundary, despite being parallel to middle Bronze Age ditches.

2.2.10 Undated

Four possible features [518, 520, 522 and 524] were identified in the machine pit *c.* 140m to the south-west of Cemetery Road. Due to the restricted area of examination it is uncertain if these are ditches, pits or geological features. The fill of [520] contained a tiny animal bone and the fill of [522] a tiny fragment of fired clay. It is, therefore, possible that they are archaeological features, although they do not correspond to any found in the Western Bypass Area 7 investigations to the east.

2.3 Artefact assemblage

2.3.1 Introduction

The investigations produced a finds assemblage comprising mainly pottery, with smaller quantities of ceramic building material, ferrous items and animal bone (Table 1). The material was scanned to ascertain its nature, condition and, where possible, date range. With the exception of a concentration of late Saxon/Saxo-Norman and early medieval pottery in the Queens Park area, the assemblage is consistently of Romano-British date.

Area	Feature	Description	Context	Spot date*	Finds Summary
NE of Loop	12	Ditch	13	Romano-British	Pottery (175g)
	12		15	Romano-British	Pottery (14g)
	16	Ditch	17	Undated	Animal bone (76g)
	44	Ditch	47	Romano-British	Pottery (14g)
Main part of Loop	104	Trackside ditch (segment of 107)	105	Romano-British	Pottery (641g)
	104		106	Romano-British	Pottery (2.9kg); fired clay (99g); animal bone (16g)
	109	Trackside ditch (segment of 130)	110	Romano-British	Pottery (266g); animal bone (113g)
	111	Gully (segment of 132)	112	Romano-British	Pottery (243g); animal bone (153g)
	113	Gully (segment of 132)	114	Romano-British	Pottery (13g); iron nail x1; animal bone (153g)
	115	Gully (segment of 132)	116	Romano-British	Pottery (3g); animal bone (5g)
	117	Tree-throw	118	Romano-British	Pottery (16g)
	120	Ditch (segment of 120)	121	Romano-British	Pottery (122g); iron nails x4; animal bone (28g)
	130	Trackside ditch (general number)	131	Romano-British	Pottery (57g); roof tile (63g); animal bone (40g)
	153	Ditch (segment of 138)	154	Romano-British	Pottery (62g); animal bone (77g)
	155	Ditch (segment of 140)	156	Undated	Animal bone (1g)
	157	Gully (segment of 132)	158	Romano-British	Pottery (3g); animal bone (129g)
	161	Ditch (segment of 144)	162	Romano-British	Pottery (351g); iron strap (RA 101); animal bone (42g)
	163	Ditch (segment of 142)	164	Romano-British	Pottery (65g); roof tile (84g)
	168	Ditch (segment under 163)	169	Romano-British	Pottery (421g); roof tile (340g); animal bone (232g)
	168		171	Romano-British	Pottery (87g)
	172	Pit	173	Romano-British	Pottery (72g); animal bone (125g)
	174	Pit	175	Romano-British	Pottery (148g); animal bone (113g)
	186	Ditch (segment of 144)	187	Romano-British	Pottery (18g); roof tile (200g); animal bone (32g)
	201	Ploughsoil	201	Saxon	Pottery (7g)
	210	Pit	212	Romano-British	Pottery (16g)
E of Cemetery Rd	301	Ploughsoil	301	Romano-British	Pottery (84g)
	312	Pit	314	Romano-British	Pottery (30g)
	316	Ditch	319	Undated	Fired clay (22g)
	324	Pit	325	Romano-British	Pottery (31g)
	326	Ditch	327	Romano-British	Pottery (243g)

Area	Feature	Description	Context	Spot date*	Finds Summary
Allen Park	408	Pit	409	Early medieval	Pottery (3g); fired clay (145g); animal bone (2g)
	418	SFB (same as 420)	419	Late Saxon	Pottery (10g); iron knife (RA 1)
	420	SFB (same as 418)	421	Late Saxon	Pottery (61g); animal bone (14g)
	422	Ditch (segment of 451)	423	Early medieval	Pottery (19g)
	422		424	Early medieval	Pottery (8g); animal bone (154g)
	425	Ditch (segment of 133)	426	Undated	Animal bone (136g)
	427	SFB	428	Late Saxon	Pottery (10g)
	449	Ditch (segment of 447)	450	Undated	Animal bone (135g)
	457	Pit	460	Early medieval	Pottery (151g); roof tile (88g); animal bone (10g)
	463	Pit	464	Undated	Animal bone (382g)
	463		465	Undated	Fired clay (43g); animal bone (3g)
	463		466	Undated	Animal bone (93g)
W of Cemetery Rd	503	Grave	504	Roman	Iron nails x2, and (RAs 501-507); human bone (20g)
	520	Ditch	521	Undated	Animal bone (9g)
	522	Ditch	523	Undated	Fired clay (3g)

Table 1: Artefact Summary by Trench and Feature

2.3.2 Pottery

Two hundred and forty-seven sherds representing 182 vessels (6.4kg) were recovered. These were examined by context and quantified using minimum vessel and sherd count, and weight. The pottery is moderately fragmented, with an average sherd weight of 26g, and survives in fair condition. Thirty-one fabric types were identified using common names and type codes in accordance with the Bedfordshire Ceramic Type Series, currently maintained by Albion Archaeology (Table 2).

Fabric Type	Common Name	Sherd No.	Context / Sherd No.
Late Iron Age			
F05	Grog and shell	**1**	(421):1
F06B	Medium grog	**2**	(162):1, (301):1
F09	Grog and sand	**2**	(314):1, (327):1
Romano-British			
R01	Samian	**5**	(15):1, (106):2, (162):1; (169):1
R03B	Gritty white ware	**2**	(106):2
R03C	Smooth white ware	**2**	(112):1, (164):1
R05D	White-slipped orange sandy	**1**	(106):1
R06B	Coarse grey ware	**14**	(110):1, (112):1, (114):1, (121):1, (162):2, (164):1, (169):3, (175):1 (327):3
R06C	Fine grey ware	**43**	(105):6, (106):9, (110):5, (112):3, (114):1, (121):4, (131):1, (154):3; (162):2, (164):1, (169):2, (171):1, (173):1, (175):1, (187):1, (327):2
R06D	Micaceous grey ware	**10**	(106):4, (112):1, (121):1, (131):1, (171):1, (173):1, (175):1
R06E	Calcareous grey ware	**1**	(164):1
R06F	Grog and sand grey ware	**2**	(169):1, (301):1
R06H	White-slipped grey ware	**9**	(106):2, (112):6, (121):1
R06I	Black-slipped grey ware	**1**	(121):1
R07B	Sandy black ware	**3**	(106):1, (131):1, (158):1
R07C	Gritty black ware	**1**	(327):1
R10A	Buff gritty	**1**	(175):1
R10B	Fine buff	**2**	(131):1, (173):1
R13	Shell	**113**	(13):14, (47):1, (105):4, (106):37, (110):8, (112):4, (116):1, (118):2, (121):5, (131):2, (162):3, (164):1, (169):9, (171):2, (173):3, (175):1, (212):6, (301):2, (314):1, (325):1, (327):5; (421):1
R18A	Pink gritty	**1**	(110):1
R33	Verulamium region mortaria	**2**	(105):1, (106):1

Fabric Type	Common Name	Sherd No.	Context / Sherd No.
Saxon			
A16	Coarse mixed quartz	**1**	(201):1
Late Saxon / Saxo-Norman			
B01	St Neots-type ware	**9**	(419):4, (421):4, (428):1
B01C	St Neots-type ware (mixed)	**1**	(428):1
Medieval			
B07	Shell	**9**	(409):1, (423):1, (460):7
C01	Sand	**2**	(460):2
C05	Sand (red margins)	**2**	(423):1, (460):1
C10	Potterspury ware	**2**	(460):2
C60	Hertfordshire type grey ware	**1**	(460):1
C71	Sand (buff-grey cored)	**1**	(424):1
UNID	Unidentified/undatable	**1**	(327):1

Table 2: Pottery Type Series

Pre-Roman

Four abraded grog tempered sherds (40g) datable to the late Iron Age occurred as residual finds in Romano-British ditches [161], [326], pit [312] and SFB [420]. An unstratified sherd (7g) derived from ploughsoil (301).

Romano-British

Roman pottery of 2nd–3rd-century date occurred in twenty features and totals 200 sherds (5.8kg), the greatest concentration (3.5kg) deriving from ditch [104]. The assemblage is primarily local in character, and is dominated by coarse ware vessels in shell tempered fabric R13 and sandy reduced ware R06 (and variants). These wares are supplemented by locally sourced oxidised wares R05D and R10A/B, and regionally traded white wares from the Verulamium region (R03C/D and R33). Diagnostic forms are lid-seated jars, everted rim and narrow-necked jars, and jars with triangular and under cut rims. They occur in a range of sizes, measuring between 100–260mm in diameter. A number of the larger shelly vessels have sooted exteriors, indicating their use as cooking pots. Bowls are either flanged, or have simple flat rims, and range in diameter between 240–340mm. Dishes with plain upright rims, flagons, beakers (including a poppyhead form) and a single mortarium complete the range of coarse ware vessel types.

Five abraded sherds of samian ware (115g), probably of central Gaulish origin, are the sole import within the assemblage. A decorated bowl and abraded footring with an illegible stamp are the only diagnostic elements.

Post-Roman

An unstratified sand tempered body sherd (7g) of early Saxon date was recovered from ploughsoil (201). SFBs within the Queen's Park area yielded ten undiagnostic shell tempered sherds (55g) in the St Neots-type ware tradition, datable to the Late Saxon / Saxo-Norman period. Hand made and wheel thrown pottery datable to the early medieval period comprises 15 sherds (137g) recovered from pits [457], [408] and ditch [422]. They occur in a range of locally sourced shell and sand tempered fabric types. Two sherds of high medieval Potterspury ware (44g) are the only regional imports. An everted rim jar is the sole vessel form, although several base angles deriving from either bowls or jars occur. A few are sooted, indicating their use as cooking pots.

2.3.3 Ceramic building material

Roman roof tile comprises three shell tempered pieces of *tegula* and two sand tempered examples (total weight 672g). Shelly tile fabric is similar to pottery ware type R13, and is likely to derive from the same source. *Tegulae* range in thickness between 17–32mm; one retains a shallow flange, and is decorated with a single groove along the flange base. *Tegulae* derive entirely from the main part of the Loop (ditches [130], [163], [168], [186]). Three post-Roman sand tempered flat roof tiles (103g) were recovered from pit [457] and ditch [130]. The tile from the latter is considered intrusive.

2.3.4 Ironwork

A complete whittle tanged angleback knife (Ottaway type A2) datable to the late 8th–11th century was recovered from the fill of SFB [418]. The blade edge is fairly straight, and very worn, rising slightly to a rounded tip, and has an overall length of 150mm. The fill of ditch [161] yielded a perforated strap of unknown date, likely to derive from a hinge. A small number of fragmentary Roman hobnails derived from grave [503]. The remains of seven timber nails were also recovered from the same feature. The most complete examples have flat rectangular heads and thin rectangular sectioned tapering shanks.

2.3.5 Animal bone

A total of 293 animal bone fragments, weighing 2.2kg was collected. Individual pieces are small, with an average weight of 8g, and most are abraded. Undated pit [463] yielded the greatest bone concentration (478g). Of the twenty-three other features containing animal bone, all yielded less than 250g. Amongst the fragments identified to species, cattle and pig remains are most abundant. Diagnostic bone elements are mainly representative of post-cranial meat-bearing parts (limb bones, ribs and scapulae). However, the presence of a number of cranial elements represented by loose teeth, skull and mandible fragments, suggest the practice of butchery.

2.3.6 Human bone

Cremated ?human bone weighing 20g was recovered from the sieved residue of an environmental sample taken from grave [503].

3. CHRONOLOGICAL DISCUSSION

Archaeological remains were discovered and investigated in all parts of the pipe corridor. Their significance is discussed below and because they were found in a narrow investigation area this is linked, where possible, to the results of adjacent investigations (Albion 2010b).

3.1 Late Neolithic/early Bronze Age

The discovery of two possible small pits of this period is significant because, although these features dominate the settlement evidence for this period in southern Britain, they are considered to be under-represented in the archaeological record in Bedfordshire (Luke 2007, 39) and the Eastern region (Brown and Murphy 1997, 14–16). This is in part due to their small size and dispersed distribution, which make it difficult to find them by anything other than open area excavation. Discussion continue as to whether pits of this type represent permanent settlements or sites that were repeatedly occupied for relatively short periods of a time by an essentially mobile population (Thomas 1999; Garrow *et al.* 2005).

3.2 Middle Bronze Age

The field ditches are part of an extensive and well dated middle Bronze Age landscape within the Biddenham Loop (Figure 8). No such evidence had been found prior to the David Wilson Homes investigations and it represented one of the most significant discoveries. It is clear that the Biddenham Loop was transformed during this period — the open, monument-dominated landscape of the Neolithic was replaced by enclosed fields and trackways. Middle Bronze Age fields are rarely found in Bedfordshire. Some late Bronze Age field systems have been suggested in the county (Dawson 2007, 61), but the only example believed to originate in the middle Bronze Age is at Broom (Cooper and Edmonds 2007, 89). Here, the evidence comprised ditches and posthole alignments but their character and extent were highly variable (*ibid*. 83-7). Far more extensive systems are known in the Thames Valley, many of which are believed to originate in the middle Bronze Age and to continue to develop until the end of the late Bronze Age (Yates 1999: 2007).

3.3 Late Bronze Age/early Iron Age

The presence of a pit alignment within the water main corridor was expected and the same alignment of pits had been examined in previous investigations within the Biddenham Loop (Luke 2008, 32-3)(Figure 9). The appearance of pit alignments may be linked to increasing territoriality during this period. By their very nature pit alignments must have functioned as boundaries but, on the other hand, their interrupted nature would not have provided an effective physical barrier. Individually, such enigmatic boundaries have local and regional significance. However, the importance of the one on the Biddenham Loop is enhanced by the existence of an adjacent contemporary settlement within the Bovis investigations (Luke 2008, 34-7) and by the fact that they are integrated into the overall evolution of the landscape. The spatial and stratigraphical relationship that the main pit alignment has with the middle Bronze Age fields is curious. On strict stratigraphical grounds it is clearly later than the some of the field ditches. However, in the main, its course takes it through the unenclosed zone in between the two field systems, suggesting that they were still in use. This may explain why, where it cuts across fields, it does so in peripheral areas.

3.4 Middle Iron Age

The identification of a possible isolated storage pit is interesting because activity away from farmsteads in the past has rarely been found. However, where present, it usually comprises features of this type which presumably represent areas of short-term or seasonal activity, such as grain storage. Similar evidence is increasingly being recognised within more extensive excavations (Haselgrove *et al*. 2001, 11).

3.5 Romano-British

The investigations have provided additional information on three discrete Romano-British settlements (Figure 10).

- **Kempston Church End roadside settlement**- evidence for activity included enclosure ditches, large pits and a cremation burial (Figure 11). This settlement is known to extend over at least 18ha, in the form of a fairly regular, gridded layout of enclosures spread out along a roadway. Although the investigations were located on what was thought to be the periphery of the settlement, the presence of large pits and domestic debris suggests that in this area domestic activity may have extended to within 20m of Cemetery Road. The cremation burial is interesting because nationally it is relatively uncommon to find evidence for wooden boxes containing cremated bone in Roman Britain. Two unurned cremation burials, containing nails, and in one case hobnails, were found during the David Wilson Homes investigations on the Biddenham Loop. It is, therefore, possible that these 'box burials' are part of a very local tradition in this part of the Ouse Great Valley.
- **Southern Biddenham Loop farmstead**- evidence for activity included trackside and enclosure ditches, pits and a possible structure. Although the position of the trackway was known from non-intrusive surveys, it is now clear that the farmstead extended much further north along it than previously thought.
- **North-east Biddenham Loop farmstead**- two ditches including the main boundary of the settlement were present within the water main corridor.

The defining characteristic of the Romano-British farmsteads on the Biddenham Loop is the rectilinear, ditched enclosure system (Luke 2008, 58) and this is confirmed by the recently investigated ditches. A similar layout occurred in the two farmsteads at Marsh Leys (Luke and Preece 2011). Williams *et al.* (1996, 83) have suggested that the creation of large enclosed areas was common practice in lowland Britain during the second half of the 1st century AD and the dating evidence from the Biddenham Loop farmsteads would be broadly consistent with such a date.

Although it was first thought to be a villa (Dawson 2004) reconsideration led Dawson to consider the Kempston Church End settlement to be to be a large, planned settlement and the only example of its kind in Bedfordshire (Dawson 2007, 73). However, although the main trackway is not a known road recorded in Roman documents, the settlement has all the characteristics of a roadside settlement. A comparable settlement at Higham Ferrers, Northants., located *c*. 20km to the north, has recently been published (Lawrence and Smith 2009).

3.6 Late Saxon / Saxo-Norman and early medieval

The water main corridor on the Allen Park area of Bedford uncovered a previously unknown settlement. The narrow width of the investigation area and absence of adjacent investigations means that the nature and extent of this settlement remain unknown. However, it originated in the late Saxon period when two sunken featured buildings were in use; one is dated to the late 8th–11th century on the basis of the presence of a diagnostic knife. It is located *c.* 250m from an early Saxon settlement found within the David Wilson Homes investigations to the north-east of the Biddenham Loop (Figure 12). This may be significant because there is a regional phenomenon whereby early Saxon settlements tended to be deserted in favour of new locations during the 7th century —- the so-called 'Middle Saxon shuffle' (Wade 2000, 23). Although no buildings of early medieval date were identified, the presence of ditches and pits containing pottery of this period suggests that occupation continued into the Norman period.

The Domesday manor of Biddenham had two mills. One was almost certainly in the vicinity of Church End; it has been suggested that the other was in the Ford End area of Bedford (Bigmore 1979, 37), within which Allen Park lies. Historical documents suggest a hamlet might have existed near the latter but it has always been thought to be on the south side of the river. Although the settlement evidence found in the water main is located *c*. 150m from the present river, it seems likely that it represents part of this hamlet.

4. ANALYSIS AND PUBLICATION

The results of the water main investigations are significant and worthy of publication in their own right. However, a stand-alone article would not enable them to be considered in a meaningful landscape context. Therefore, it is intended that they will be fully integrated into the combined analysis and publication of the David Wilson Homes and Bedford Western Bypass projects.

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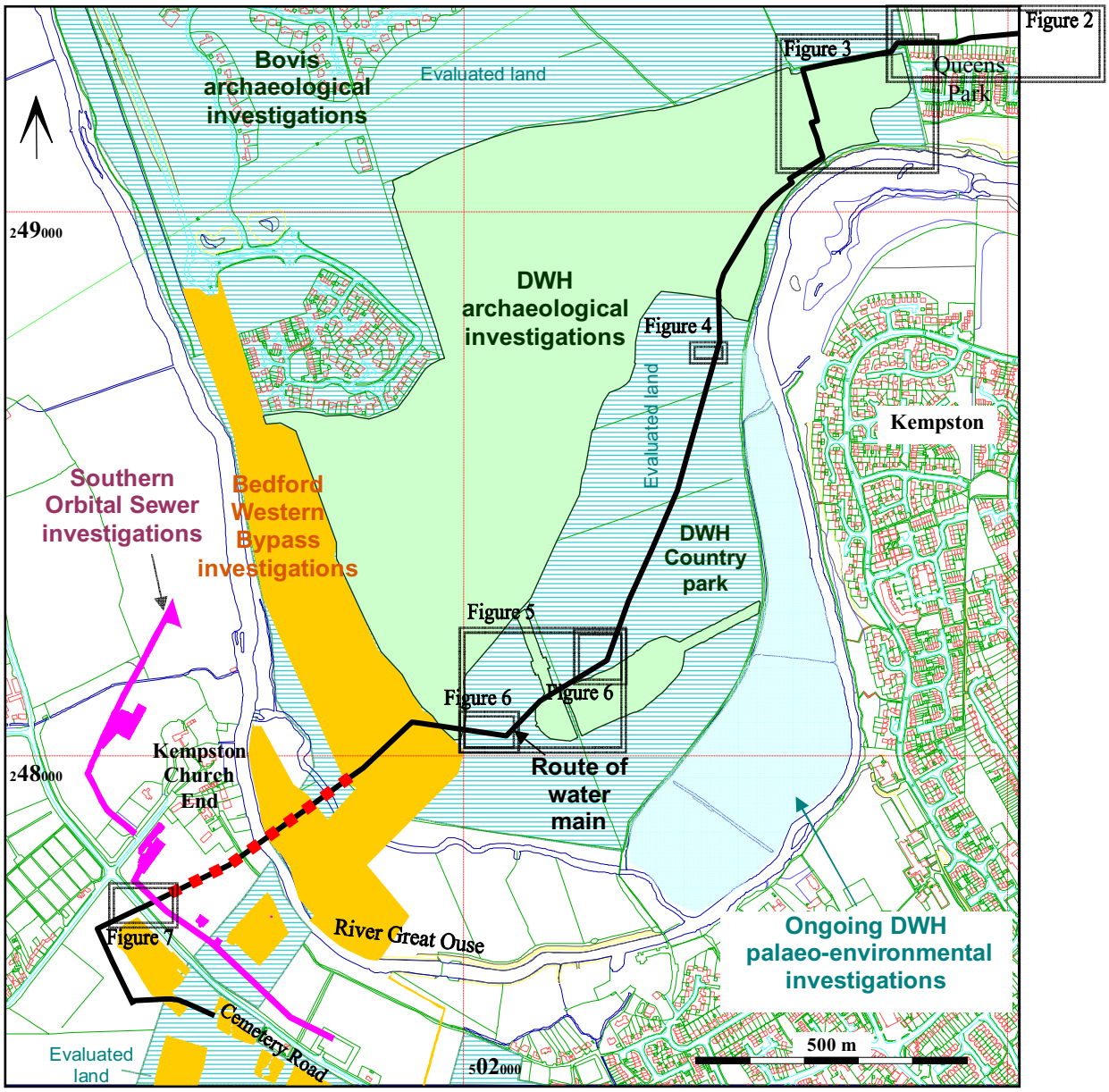
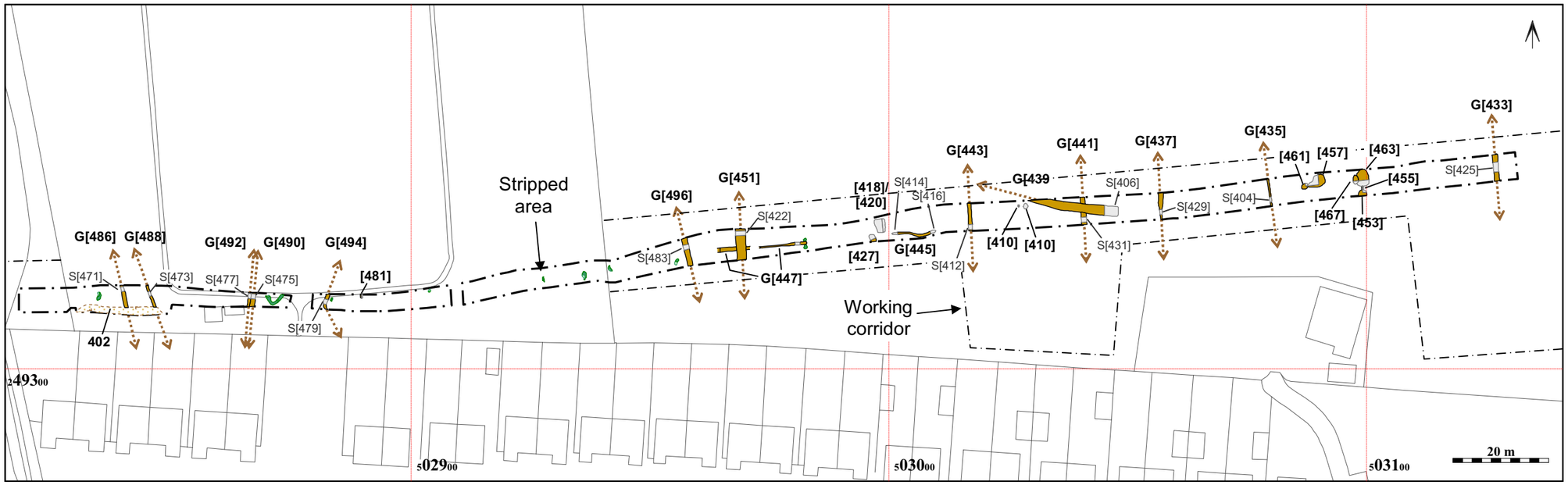


Figure 1: Route of water main with previous/on-going archaeological investigations



Key

- Archaeological feature
- Archaeological feature; excavated segment
- Tree root disturbance
- Projected line

Linear features are prefixed with G for general number and S for segment number

Figure 2: All features plan for water main in Queens Park

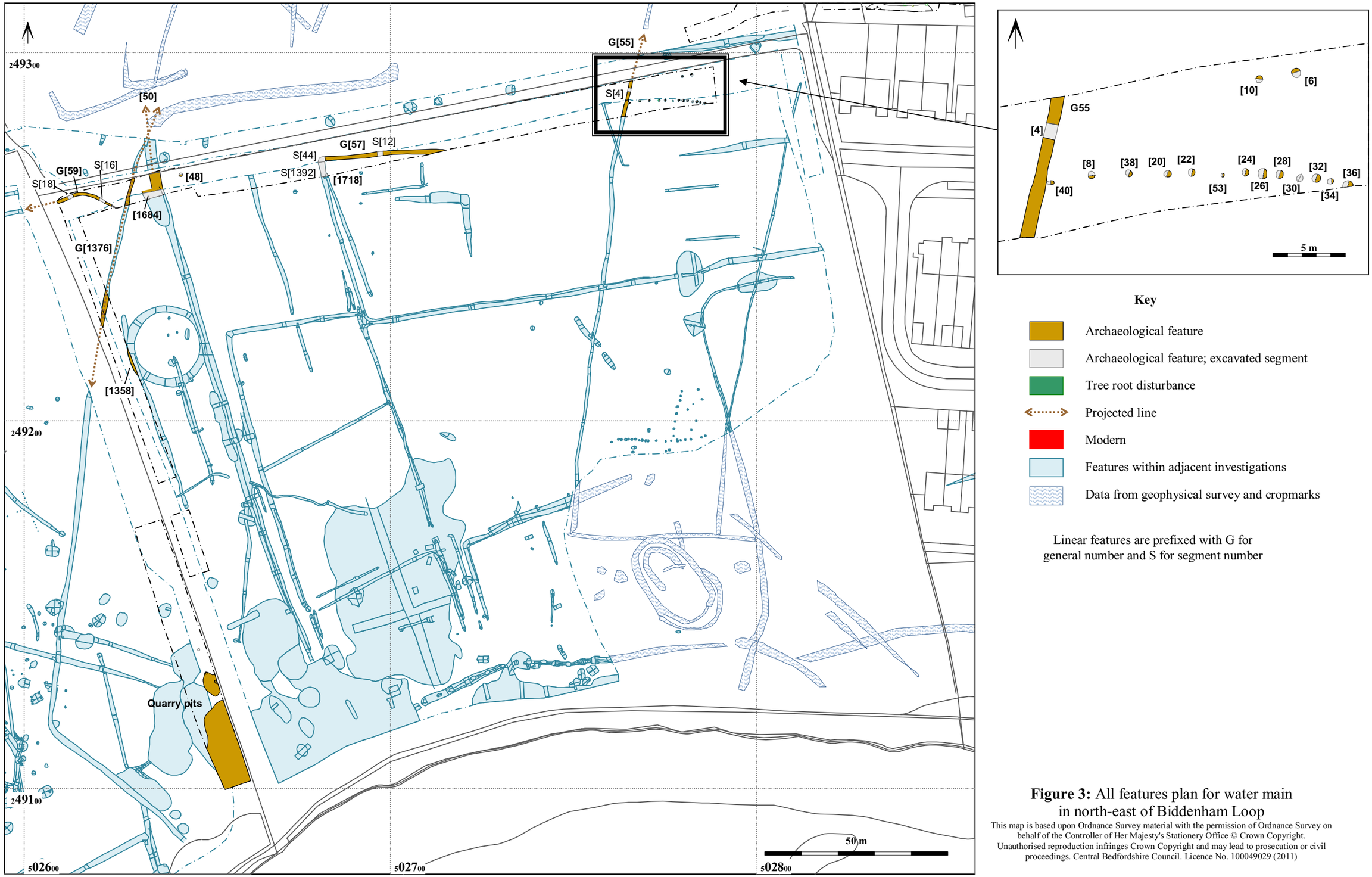


Figure 3: All features plan for water main in north-east of Biddenham Loop

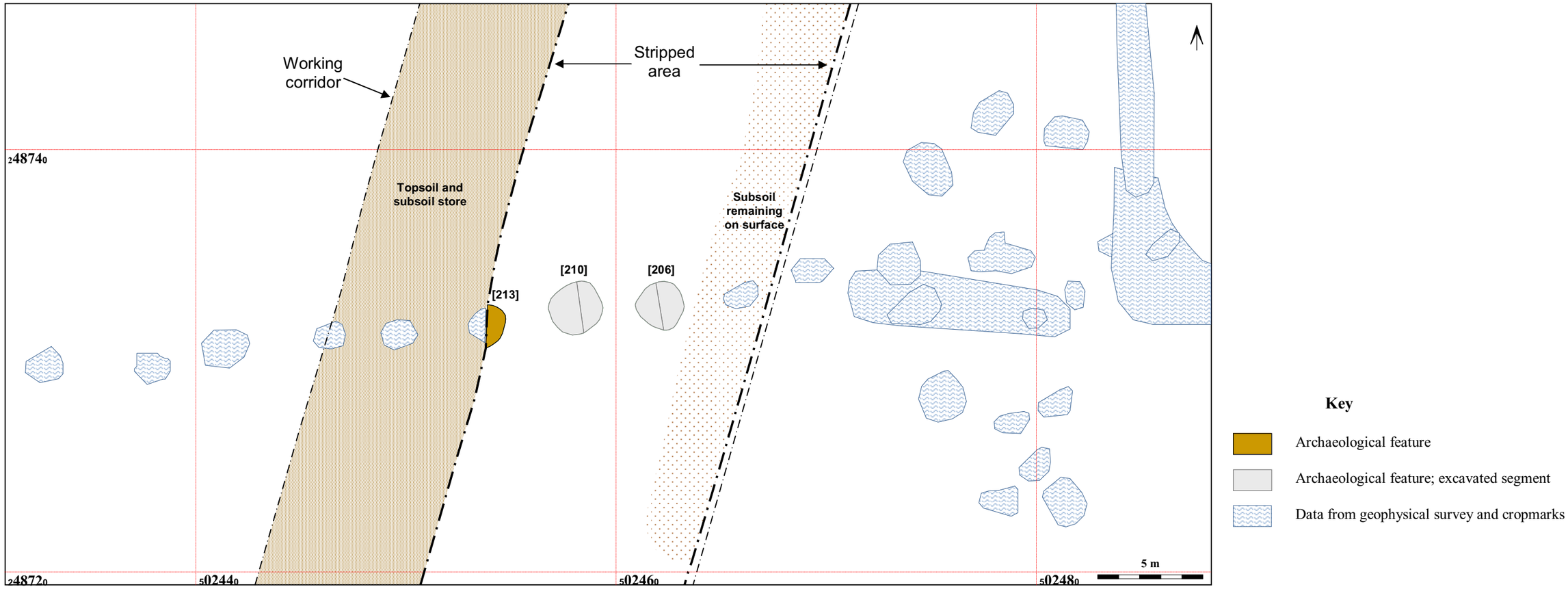


Figure 4: All features plan for water main in eastern part of Biddenham Loop

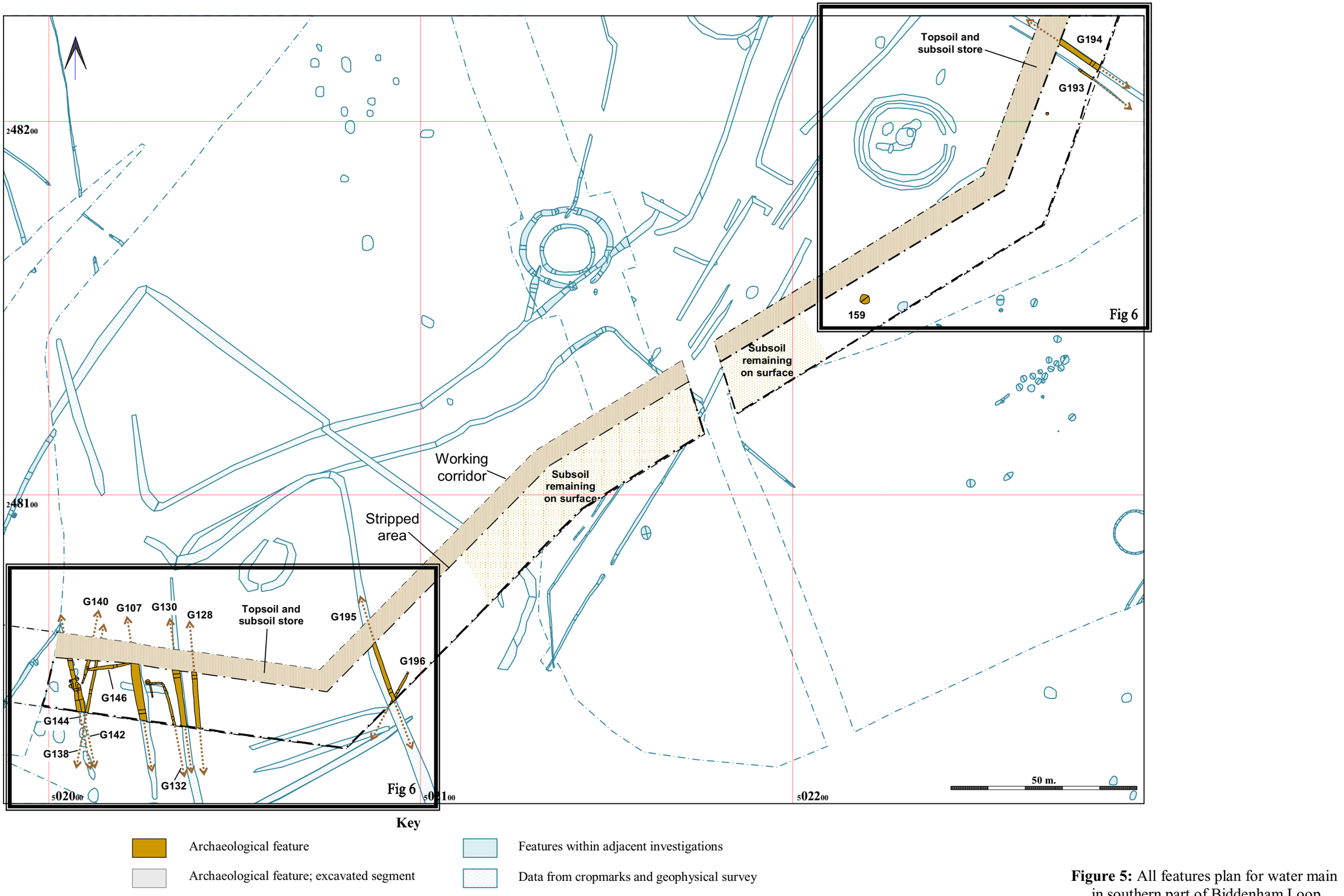
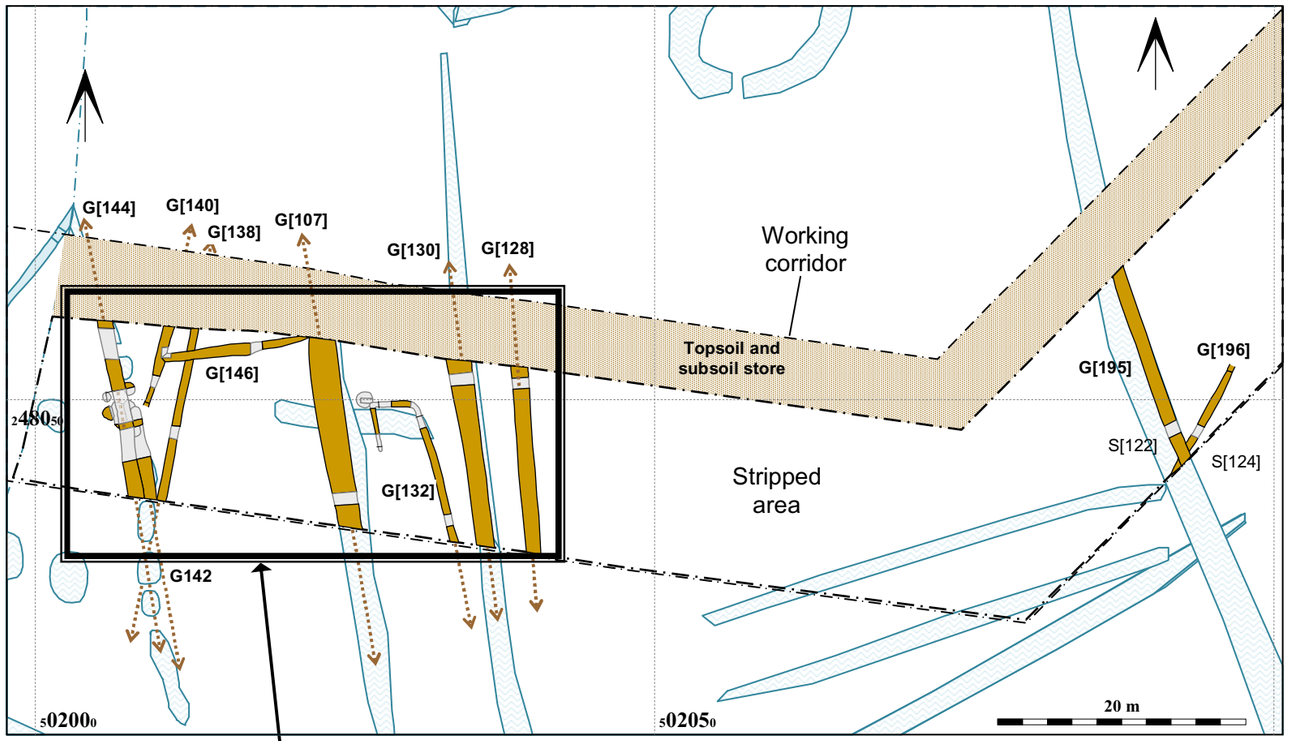
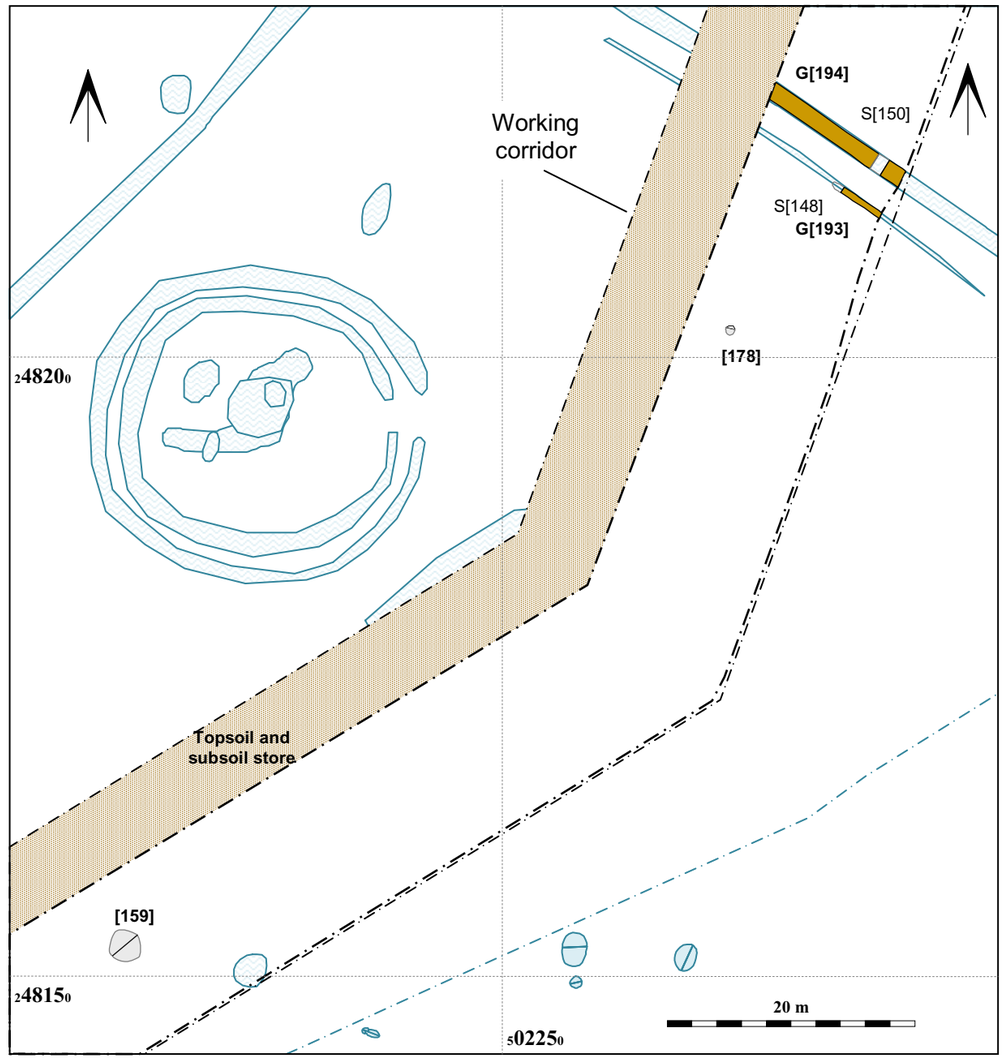
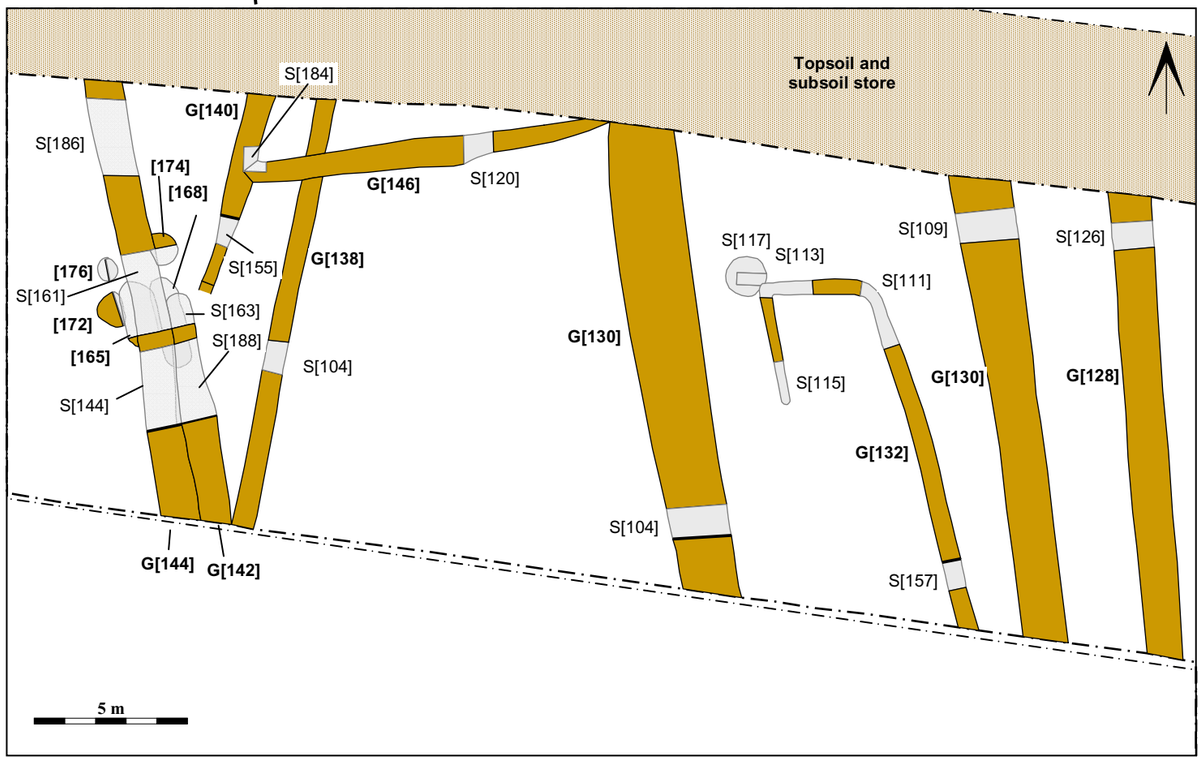


Figure 5: All features plan for water main in southern part of Biddenham Loop







Key

- Archaeological feature
- Archaeological feature; excavated segment
- Projected line
- Features within adjacent investigations
- Data from cropmarks and geophysical survey

Linear features are prefixed with G for general number and S for segment number

Figure 6: Detail plans for water main in southern part of Biddenham Loop

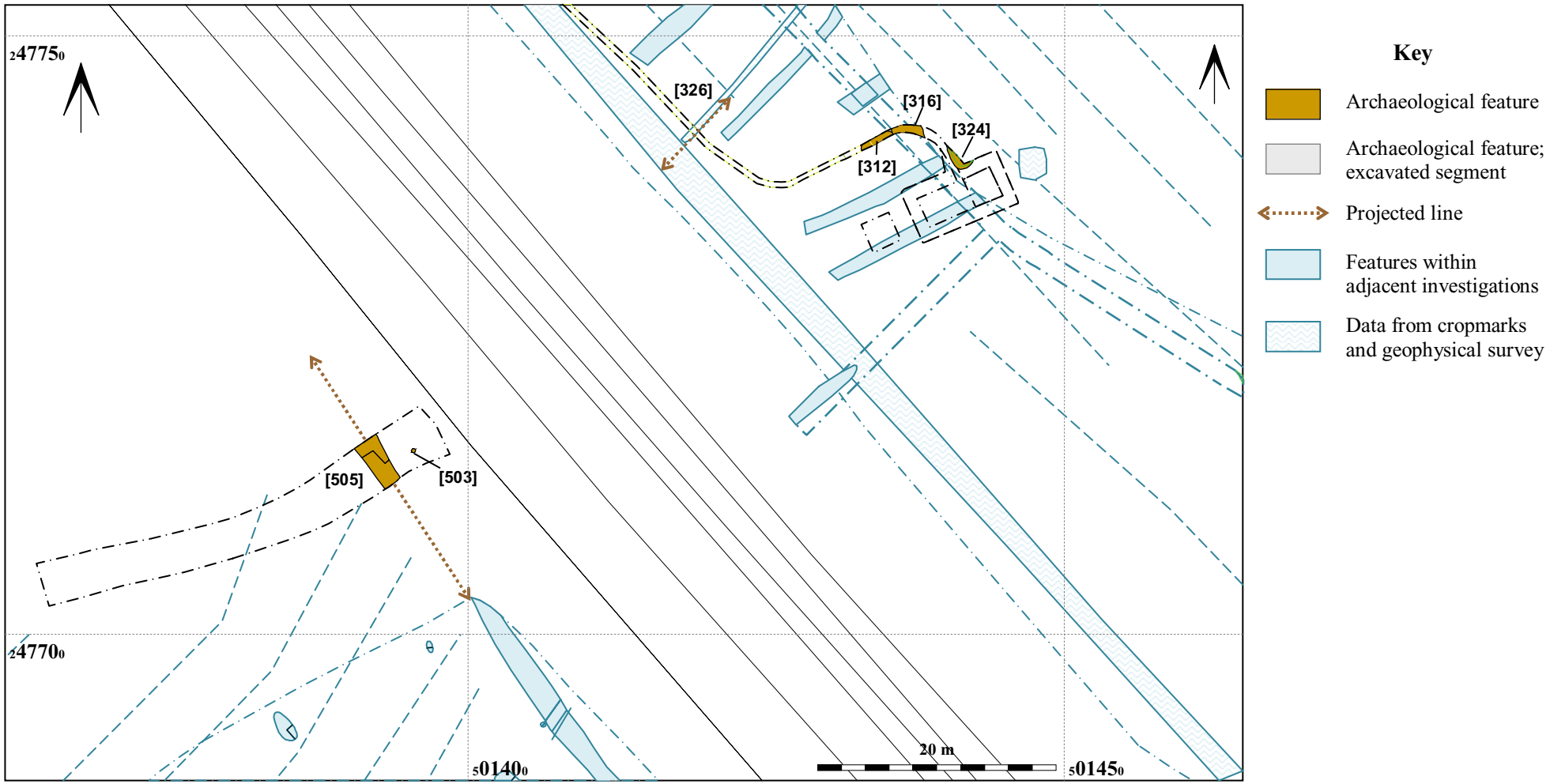


Figure 7: All features plan for water main adjacent to Cemetery Road

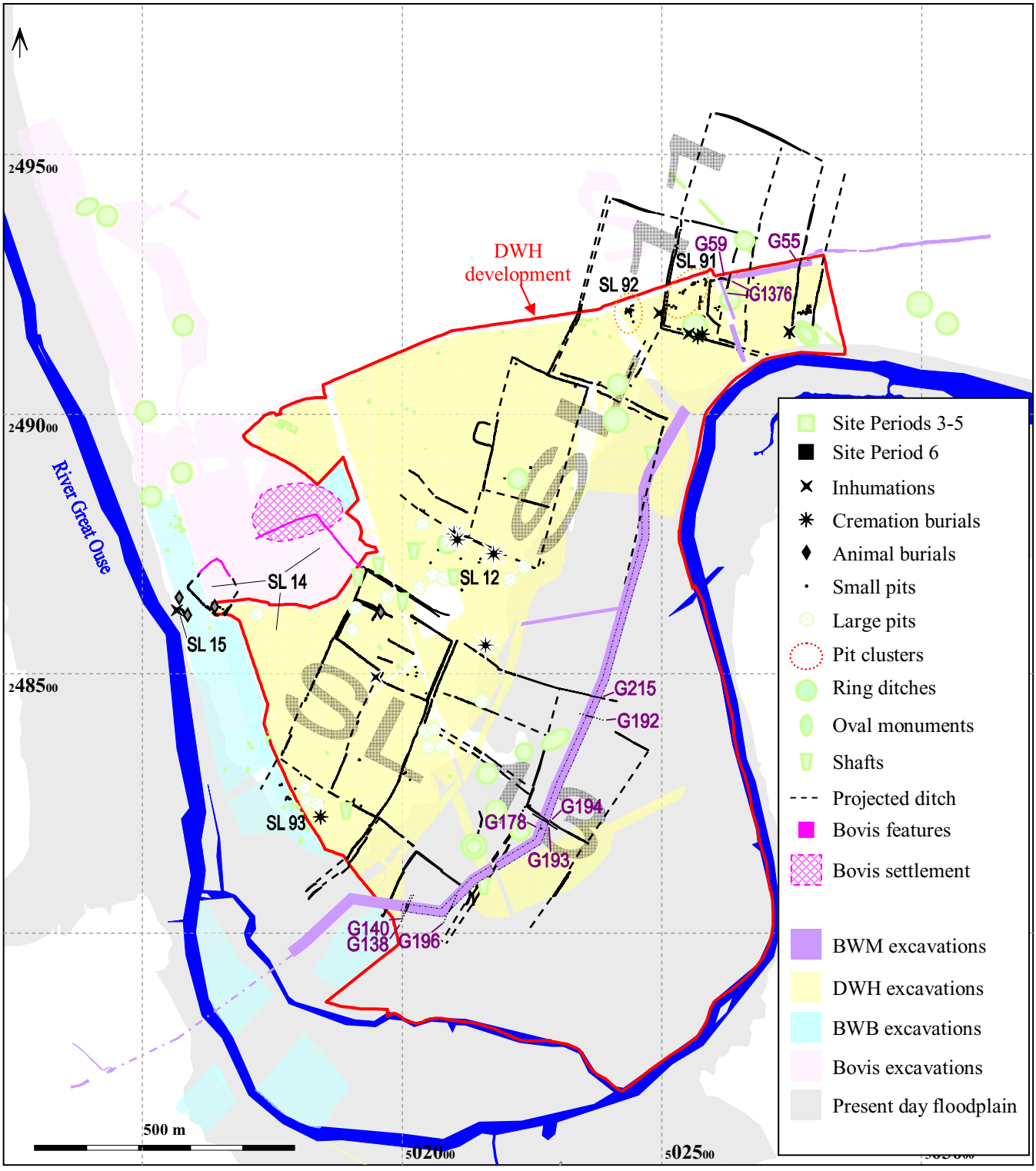


Figure 8: Middle Bronze Age evidence from Bedford Water Main in the context of previous investigations (based on Albion 2010, fig. 6.2)

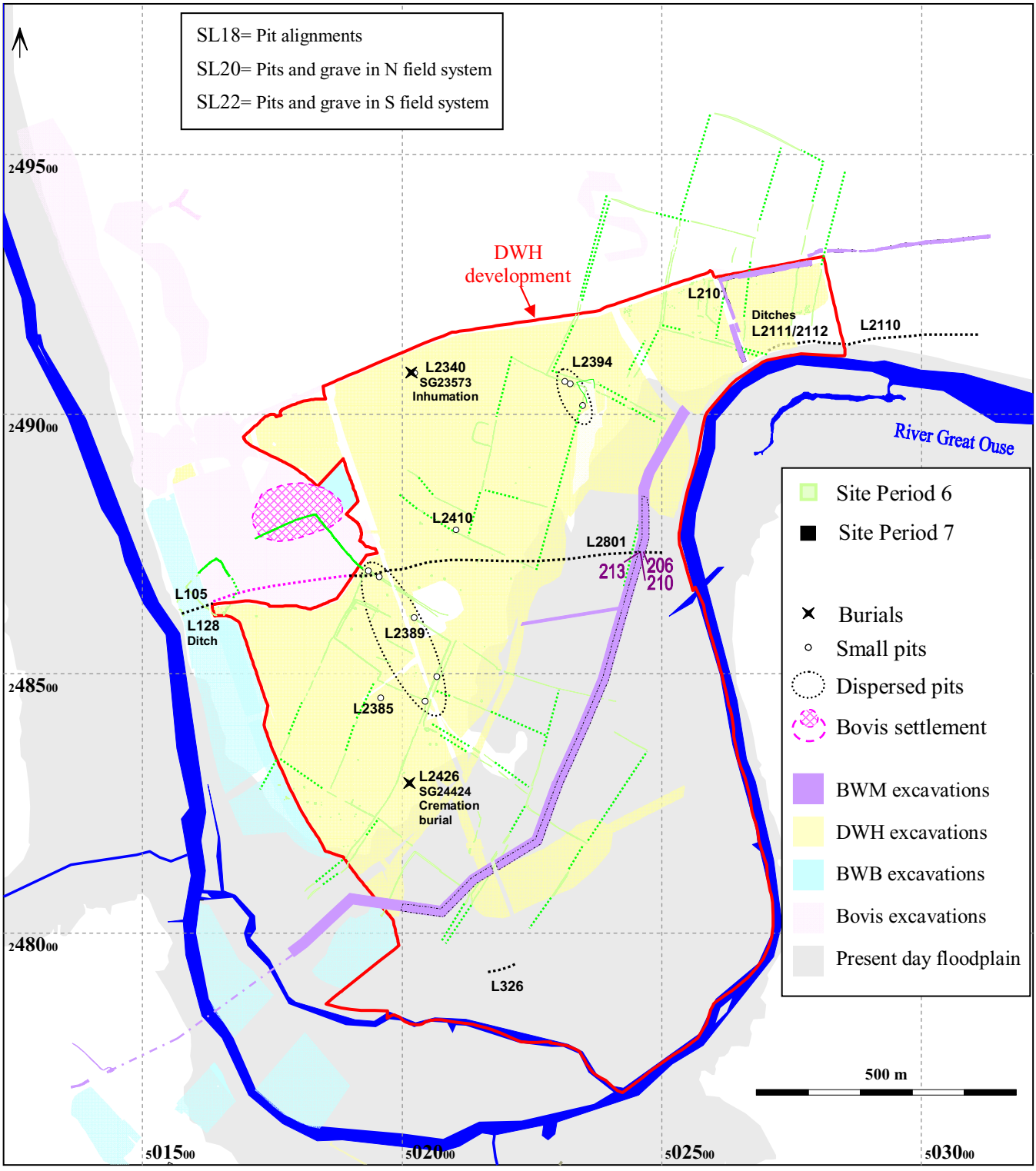


Figure 9: Late Bronze Age/early Iron Age evidence from Bedford Water Main in the context of previous investigations (based on Albion 2010, fig. 7.2)

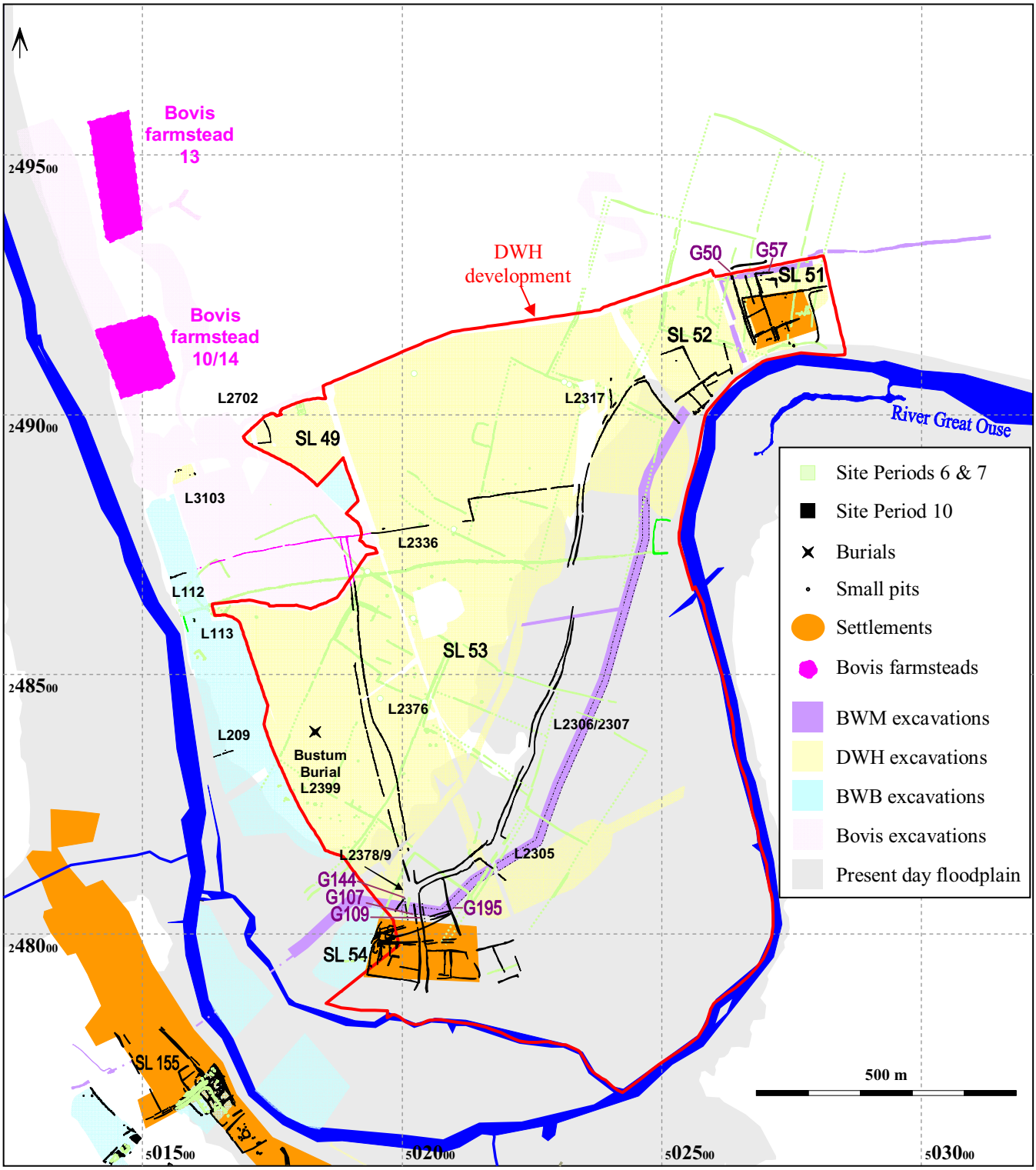


Figure 10: Romano-British evidence from Bedford Water Main in the context of previous investigations (based on Albion 2010, fig. 10.2)

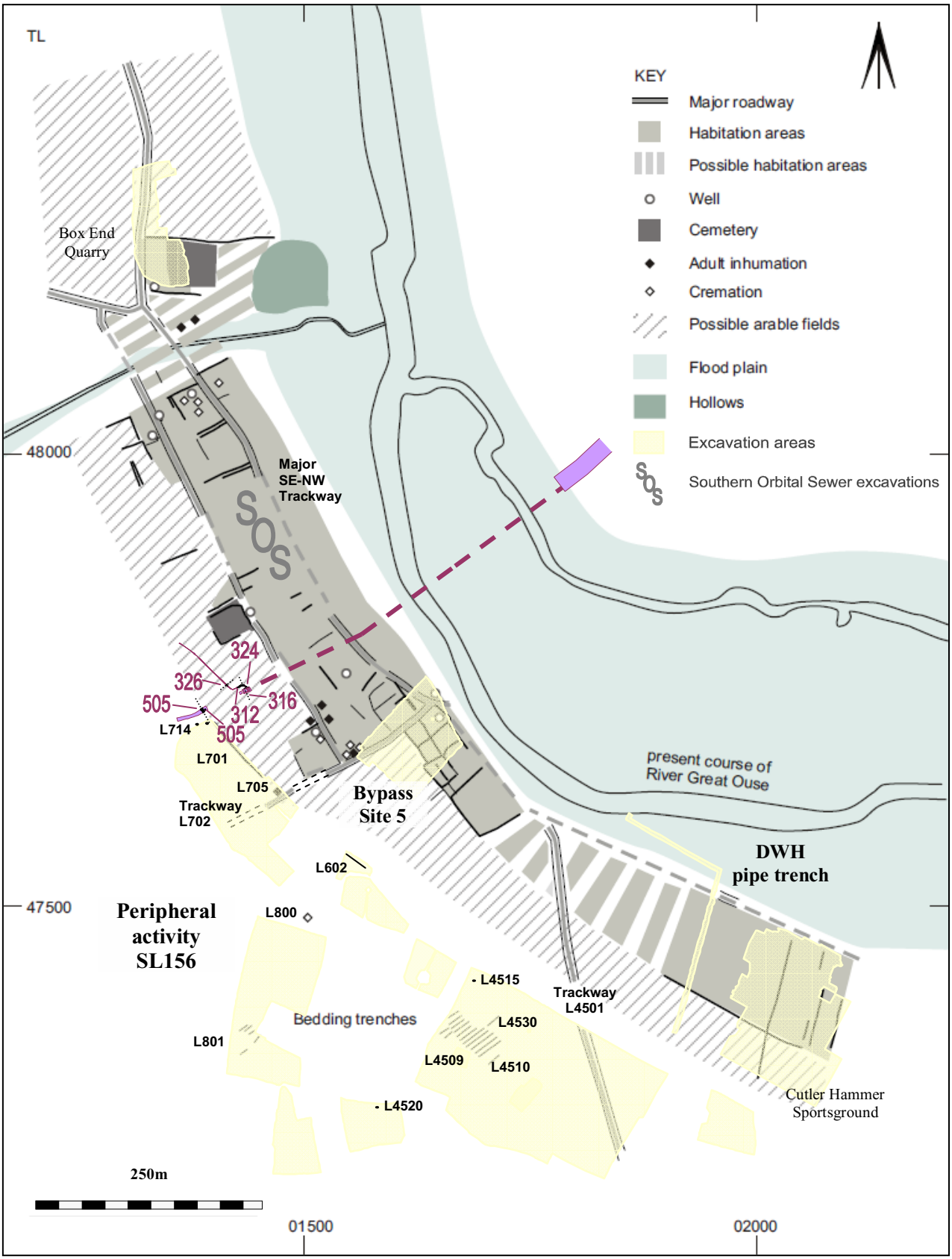


Figure 11: Romano-British: Kempston Church End settlement evidence from Bedford Water Main in the context of previous investigations (based on Albion 2010, fig. 10.4)

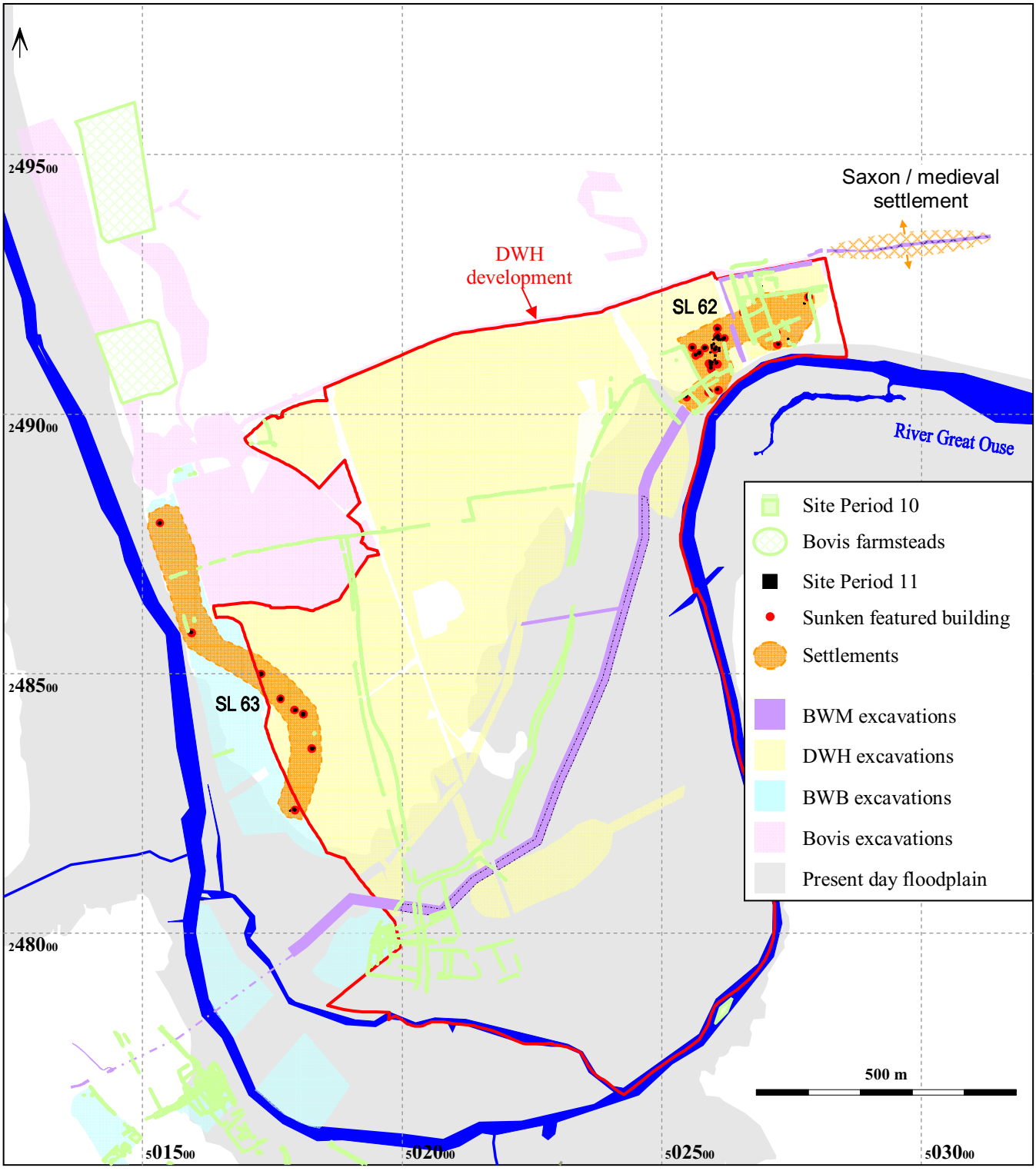


Figure 12: Saxon and early medieval evidence from Bedford Water Main in the context of previous investigations (based on Albion 2010, fig. 11.2)