

BONDS MILL CHANNEL, RIVER FROME

ARCHAEOLOGICAL MONITORING OF GEOTECHNICAL TEST PITS

commissioned by The Environment Agency

June 2016





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project info

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PROJECT SUMMARY

Headland Archaeology (UK) Ltd undertook an archaeological watching brief during the geotechnical site investigation of a relict palaeochannel. The evidence indicates that the palaeochannel was active in the post-medieval period and based on artefacts found within its fill most probably fell into disuse and underwent sedimentation over the last 200 years, becoming progressively full of organic rich clay sediment up until at least the middle of the 20th century. In principle, based on the observations of the geotechnical test pits, there are no archaeological constraints for undertaking the proposed restoration work of the palaeochannel.

CONTENTS

1	INTROD	DUCTION	1
	1.1	PLANNING BACKGROUND AND OBJECTIVES	1
	1.2	SITE LOCATION, DESCRIPTION AND SETTING	1
	1.3	GEOLOGY	1
	1.4	ARCHAEOLOGICAL BACKGROUND	1
2	AIMS		2
	2.1	METHOD	2
3	RESULT	TS	2
4	CONCLU	USIONS	3
5	BIBLIO	GRAPHY	3
6	APPEND	DICES	4
	APPEND	DIX 1 TEST PIT RECORD SHEETS	4
	APPEND	DIX 2 FINDS ASSESSMENT	6
		Finds catalogue	б
	APPEND	DIX 3 SITES 4 AND 5 BONDS MILL AND LOWER MILLS	7
		Bonds Mill	7
		Lower Mills	7
		Map regression, air photos, LiDAR data and site visit	7

LIST OF ILLUSTRATIONS

ILLUS 1 SITE LOCATION	VIII
ILLUS 2 19TH CENTURY CULVERT OVER PALAEOCHANNEL	2
ILLUS 3 VIEW OF EXCAVATOR AT TEST PIT 4 IN AREA 2 OF THE PALAEOCHANNEL	3
ILLUS 4 VIEW OF TEST PIT 2 SHOWING THE LIGHT GRAVELS AT THE BASE OF THE CHANNEL (2006)	3
ILLUS A3.1 A PLAN OF THE THAMES AND SEVERN NAVIGATION LAID DOWN FROM ACTUAL SURVEYS BY ROB WHITHWORTH ENGINEER 1783	7
ILLUS A3.2 KNOWN HERITAGE ASSETS AROUND BOND'S MILL AND LOWER MILLS	9
ILLUS A3.3 TITHE MAP OF 1838 SHOWING BONDS MILL AND LOWER MILLS	11
ILLUS A3.4 1886 OS MAP SITE 4-7	13
ILLUS A3.5 1903 OS MAP SITE 4–7	15
ILLUS A3.6 1921 REVISION OS MAP SITE 4-7	17
ILLUS A3.7 1924 OS MAP SITE 4–7	19
ILLUS A3.8 1938 OS MAP SITE 4-7	21
ILLUS A3.9 PLAN OF THE RIVER FROME AND CANAL PROBABLY DATING FROM THE MID 20TH CENTURY (COPIED WITH KIND PERMISSION OF GLOUCES OFFICE – T.S.175(6)	TER RECORDS 23
ILLUS A3.10 PLOT OF THE LIDAR DATA AROUND BONDS MILL AND LOWER MILLS	25



ILLUS 1 Site location

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ARCHAEOLOGICAL MONITORING OF GEOTECHNICAL TEST PITS

1 INTRODUCTION

1.1 PLANNING BACKGROUND AND OBJECTIVES

Headland Archaeology (UK) Ltd was commissioned by the Environment Agency to undertake archaeological monitoring of geotechnical test pits at Bond's Mill, Stroud, Gloucestershire. The Environment Agency, in partnership with the Severn Rivers Trust, is proposing the restoration of a relict palaeochannel at Bond's Mill to allow fish to bypass the weirs as part of their programme of ecological improvements to the Lower River Frome in Gloucestershire. Geotechnical site investigation work was required to assess the feasibility and design of these proposals (Illus 1).

Although no formal planning requirements were attached to this work, in line with best practice, archaeological monitoring of the test pits was undertaken to establish the archaeological potential of the palaeochannels, in particular whether there would be any inprinciple constraints on undertaking the proposed restoration work.

1.2 SITE LOCATION, DESCRIPTION AND SETTING

The palaeochannel lies between two existing channels of the River Frome on a meadow south-east of Bond's Mill industrial estate within the parish of Stonehouse. There is an existing connection between the palaeochannel and the River Frome through which the river still flows via an active culvert which passes underneath a railway bridge, constructed in the mid nineteenth century. The geotechnical investigation of the palaeochannel was divided into two areas; Area 1 to the west of the railway line and Area 2 to the east of the railway line.

1.3 GEOLOGY

The underlying bedrock geology is Charmouth Mudstone which is at the top of Blue Lias Formation. This is a sedimentary bedrock that formed approximately 199 to 182 million years ago in the Jurassic Period. The superficial deposits overlying the bedrock are alluvial (clay, silt, sand and gravel) that were deposited over the last 2 million years in the Quaternary period. (BGS 2015)

1.4 ARCHAEOLOGICAL BACKGROUND

Headland Archaeology has previously produced a comprehensive desk-based assessment of the River Frome proposals (Boucher & Brekmoe 2014), which is summarised below (a full version of this is included in Appendix 3).

There are no known prehistoric, Romano-British, or Anglo-Saxon within the Development Area (DA) at Bonds Mill. No significant works have taken place within the DA, save for a watching brief on Stroudwater Canal at the northern edge of the site (NMR 1527745) which uncovered no archaeology.

In the Domesday Book there is a reference to two mills at Stonehouse (Boucher & Brekmoe, 2014, 45), however the first clear reference to a mill in the DA is during the 15th century at Stonehouse Lower Mills, when it was leased by William Carver. Through subsequent owners it became a cloth mill sometime after 1683, after which the mill expanded and then finally closed in 1906.

Bonds Mill was first referred to in the 1714 deed of Stonehouse Manor. After a series of redevelopments, including a power loom installation in 1837, the cloth mill was finally closed in 1934.

The area became a significant centre for the cloth trade in the 18th century and around 1760 the unique Kemmett Navigation was constructed. This was a solution that used an assortment of cranes and mill cooperation in order to transport materials to and from the River Severn. This resulted in the straightening of the river course and the subsequent creation of relict channels. The Kemmett Navigation is located to the north of the palaeochannel.

Culverts were constructed over the active channel in the nineteenth century (Illus 2). Water control structures appear both up- and downstream of the culvert in the form of grooved concrete upstands that appear to be able to take sluice boards. These are likely to have been used to control the flow of water within the channel, whether for stock watering or for the needs of the mill downstream. It is unclear exactly when these were installed.



The paleochannel is mapped as an active course of the River Frome on the 1838 tithe map, along with the area that had been straightened for the Kemmett Navigation. This is also true of the subsequent Ordnance Survey mapping and it appears to still have been active in 1938. The OS map of 1921 and 1938 show the land between the channel and the section for the Kemmett Navigation to be heavily wooded.

2 AIMS

The objectives of the watching brief were as follows:

- to evaluate the archaeological potential of the palaeochannel by observing the test pits and recording the deposits within;
- to produce and deposit a satisfactory archive and disseminate the results of the work via grey literature reporting and publication as appropriate; and
- > to help inform, further to the DBA, any requirements for archaeological mitigation of the channel restoration.

2.1 METHOD

Archaeological monitoring of the site was conducted on the 24th of June 2015. The works comprised machine excavation of six test pits. Each test pit was 2m in length and 0.6m in width and between 1.5m to 2m in depth, excavated at designated investigation points along the palaeochannel using a mechanical excavator equipped with a flat edged bucket (Illus 3).

All recording followed ClfA Standards and Guidance. Recording was undertaken on pro forma record sheets. Digital photographs were taken with a 7.2mp camera.

A test pit record sheet identifying the principal stratigraphic units was completed for each test pit. Additional recording was completed as appropriate using context sheets.

3 RESULTS

Deposits were generally consistent between test pits. Details of the ground make up and geology for each test pit are given in Appendix 1.

A dark brown greyish silt layer was observed in each test pit to a depth of 0.10–0.20m below ground level (BGL). This overlay a subsoil horizon of damp, grey, silty organic rich clay, which was interspersed with brown sandy clays, to a depth of 0.75–1.0m BGL. This layer was rich in decaying organic material and highly disturbed by roots. The underlying channel base was observed to be a generally well sorted white limestone gravel horizon. In Test Pits 1, 2, 3, 4, and 6 the base of the white gravel horizon was not reached because of the rising high water table, but in Test Pit 5, which was progressed more quickly, the base of the white gravel horizon was found at a depth of 2m. Beneath the white gravels in Test Pit 5, the dark blue Charmouth Mudstone bedrock was identified. The water table appears to lie at





3

ILLUS 3 View of excavator at Test Pit 4 in Area 2 of the palaeochannel ILLUS 4 View of Test Pit 2 showing the light gravels at the base of the channel (2006)

the base of the organic rich clay layer above the well sorted gravels at approximately 0.80–1.0m BGL (Illus 4).

All deposits overlying the gravel horizons in these test pits are believed to have been the result of fluvial deposition. This is due to the well sorted nature of each layer. However, in test pit 5 deposit (5004) could indicate a deliberate dump of material as the deposit appeared less well sorted and more mixed in composition.

Fragments of Post-medieval pottery, glass, clay pipe, animal bone and shoe leather were found in the organic rich clay layer and in the well sorted gravel horizon in Test Pits 1, 2, 4, and 5. Waterlogged wood was found in the well sorted white gravel horizon of Test Pit 1 at a depth of 1.5m.

4 CONCLUSIONS

The evidence indicates that the palaeochannel was active in the postmedieval period and most probably fell into disuse and underwent sedimentation over the last 200 years, becoming progressively silted up until at least the middle of the 20th century. This is in line with the development of the Kemmett Navigation, followed by the Stroudwater canal. The reductions in flow may also link to the use of the potential sluice gates visible up- and down-stream of the nineteenth century culvert bridging the palaeochannel to the south east of Test Pit 3 – if these were closed frequently it would probably have exacerbated the infilling of the channel.

All archaeological finds within the channel deposits are likely to have been incorporated within it following their discard as waste items in the post-medieval period. Larger items are likely to have been discarded close to where they were found. Smaller, lighter items could have been transported some way by the water flow. There was no evidence for prehistoric, Roman or medieval archaeological deposits in the test pits and in situ remains of this date are considered unlikely because the gravel deposits demonstrate that the channel clearly carried energetic water flows until the post-medieval period.

In principle, based on the observations of the geotechnical test pits, there are no archaeological constraints for undertaking the proposed restoration work of the palaeochannel. The bulk channel deposits appear to be of little archaeological or palaeoenvironmental value as they represent a comparatively recent period of history and have a very mixed provenance. If the works will affect the known sluice structures or culverts associated with the channel, then this could disturb features of historic or archaeological significance with the potential to contribute to current understanding of the development of the Frome waterways.

5 **BIBLIOGRAPHY**

Boucher, A & Brekmoe, L 2014 *Lower River Frome Fish Passage Project: Archaeological Desk-Based Assessment* Unpublished client report (RFMG: HAS986)

Natural Environment Research Council (NEC) 2016 British Geological Survey [online] Accessed June 2015, from <u>http://www.bgs.ac.uk/</u>

6 APPENDICES

APPENDIX 1 TEST PIT RECORD SHEETS

DOD = Depth Of Deposit

MBGL = Meters Below Ground Level

TP1	LOCATION	L (M)	W(M)	MAX. D (M)
	Area 1	2	0.6	1.75
CONTEXT	DESCRIPTION			DOD (MBGL)
1001	Topsoil: Greyish brown	0.00-0.20		
1002	Subsoil: Dark brown silt	0.20-0.90		
1003	Channel fill: Grey clay, v 1m. Layer slopes down	0.90—1.20		
1004	Channel base: Gravel with fine black-blue silt deposit. Waterlogged and organic rich with root penetration. Waterlogged wood at 1.5m. Finds: post medieval pottery, clay pipe, glass			1.20–1.75+

SUMMARY.

Organic rich alluvial deposits (silt and clay layers) overlying white limestone gravel. Post-medieval finds. Approximately 25m east of the field boundary along the palaeochannel at the point of old connection with the Frome channel to the north. Test Pit abandoned at 1.75m because of standing water.

TP2	LOCATION	LENGTH (M)	WIDTH (M)	MAX. D (M)
	Area 1	2	0.6	1.65
CONTEXT	DESCRIPTION			DOD (MBGL)
2001	Topsoil: Dark brown/slig and lighter in colour at t of Test Pit	0.00-0.10		
2002	Subsoil: Organic rich silt	r, sand and clay deposit. F	Root penetration.	0.10-0.40
2003	Channel fill: Damp light material.	0.40-0.75		
2004	Channel fill: Blue clay w the southern end of the	0.75–1.00		
2005	Channel base: Well sort Standing water at 1m. R	ed gravel deposit. Rich in Finds: post-medieval pot	organic material. tery.	1.00-1.10
2006	Channel base: Well sort material. Post-medieva	1.10-1.65+		
SUMMARY				

Organic rich alluvial deposits (silt and clay layers) overlying white limestone gravel. Post-medieval pottery. Approximately 50m east of TP1 in the centre of the palaeochannel at a meander point. Test Pit abandoned at 1.65m because of standing water.

TP3	LOCATION	L (M)	W (M)	MAX. D (M)
	Area 1	0.6	2.0	1.7
CONTEXT	DESCRIPTION			DOD (MBGL)
3001	Topsoil: Dark grey damp silt layer			0.00-0.20
3002	Subsoil: Dark			0.20-0.55

3003	Channel fill: Light grey clay with sand lenses. Little organic material.	0.55-1.15
	Standing water at 1.15m.	

 3004
 Channel base: White well sorted gravel deposit with sand matrix.
 1.15–1.70+

 Large stones towards base. Waterlogged wood found at 1.5m (SF1).
 1.15–1.70+

SUMMARY

Organic rich alluvial deposits (silt and clay layers) overlying white limestone gravel. No archaeological finds. Third Test Pit in Area 1 approximately 50m east of TP2, near to culvert under bridge in meadow. Test Pit abandoned at 1.70m because of standing water.

TP4	LOCATION	L (M)	W (M)	AV. D (M)
	Area 2	2.0	0.6	1.5
CONTEXT	DESCRIPTION			DOD(MBGL)
4001	Topsoil: Shallow greyish	brown silt layer.		0.00-0.10
4002	Subsoil: Black grey dam		0.10-0.20	
4003	Channel fill: Brown sand	0.20-0.50		
4004	Channel fill: Blue grey si water at 0.90cm. Water (SF3), post medieval po	0.50—0.95		
4005	Channel base: White we mat recovered (SF2)	ell sorted and rounded gr	avels. Woven hessian	0.95-1.50+

SUMMARY

Organic rich alluvial deposits (silt and clay layers) overlying white limestone gravel. Post-medieval finds. In Area 2 east of the railway line. At the culvert at the mouth of the palaeochannel. Test Pit abandoned at 1.50m because of standing water.

TP5	LOCATION	L (M)	W (M)	AV. D (M)	
	Area 2	2	0.6	2	
CONTEXT	DESCRIPTION			DOD (MBGL)	
5001	Topsoil: Grey brown silt			0.0-0.20	
5002	Subsoil: Grey brown da	mp silt with light brown	organic material.	0.20-0.40	
5003	Channel fill: Lens of rich part of the Test Pit.	0.25-0.40			
5004	Channel fill: Brown/yell	0.40-0.65			
5005	Channel fill: Organic rich blue black day. Very damp and plastic layer (with degrading organics. Standing water at 1m. Finds: animal bone.				
5006	Channel base: Well sort	1.0-2.0			
5007	Bedrock: Dark blue clay, possible geological base of channel. 2.0+				
SUMMARY	,				

Organic rich alluvial deposits (silt and clay layers) overlying white limestone gravel. Charmouth Mudstone underlying white gravel horizon. Finds: Animal bone. Approximately 100m east of the railway bridge on a meander in the palaeochannel by a rock outcrop. Test Pit abandoned at 2 metres because of standing water.

TP6	LOCATION	L (M)	W (M)	MAX. D (M)
	Area 2	2	0.60	1.70
CONTEXT	DESCRIPTION	DOD (MBGL)		
6001	Topsoil: Grey brown silt.			0.00-0.10
6002	Subsoil: Yellow brown s	andy clay without organ	ic material.	0.10-0.60

SUMMARY		
6005	Channel base: Greyish white fine gravels which are moderately well sorted Silt matrix	1.04—1.70+
6004	Channel fill: Very rich organic layer. High root penetration. Finds: clay pipe observed but not retrieved.	0.80—1.04
6003	Channel fill: Blue organic rich day. Tree root penetration. Base of layer sloping down from the west at 0.75m to the east at 0.80m. Standing water at base of layer.	0.60–0.80

Organic rich alluvial deposits (silt and clay layers) overlying white limestone gravel. Post-medieval clay pipe. Approximately 150m east of railway line in Area 2. Test Pit abandoned at 1.70m because of standing water.

APPENDIX 2 FINDS ASSESSMENT

BY JULIE FRANKLIN

The assemblage numbered five sherds (111g) of pottery, two sherds (15g) of glass and one clay pipe stem. All the finds are likely to date to the 19th century, though could also be later and some could be a little earlier.

Finds catalogue

ТР	CONTEXT	QTY	WEIGHT (G)	MATERIAL	OBJECT	DESCRIPTION	SPOT DATE
1	1004	1	1	Clay Pipe	Stem	narrow bore	late18th — early 20th
1	1004	1	12	Glass	Bottle	natural coloured polygonal bottle	19th — present
1	1004	1	3	Glass	Window	small sherd, good condition	Mod
1	1004	2	13	Pottery (Mod)	Modern Whiteware	transfer printed, one willow plate, one brown printed fragment	19th — present
2	2005	1	3	Pottery (Mod)	Modern Whiteware	blue transfer printed sherd	late18th — present
4	4004	2	95	Pottery (Mod)	Porcelain	two joining sherds from a jar, with hand painted design of crickets, Chinese?	18th — present

APPENDIX 3 SITES 4 AND 5 BONDS MILL AND LOWER MILLS

Bonds Mill

There are no known heritage assets within or nearby the study area dating to the Prehistoric, Romano-British or medieval period other than mill sites, which are described below. A watching brief on the northern edge of the study area (NMR 1527745) revealed no archaeology. The other recorded sites are all post-medieval in date (NMR 1445683, 1446013), several of which date to the Second World War such as NMR 1445545, a WWII military camp.

The Domesday Book refers to two mills at Stonehouse 'rendering 17s 6d' (Williams and Martin 1992, 459).

The first definite reference to the extant mill (NMR 1305449) is a deed of 1714 relating to Stonehouse Manor, then owned by clothier John Ball. In 1774 the mill was sold with four pairs of fulling stock. A power loom was installed in 1837, cottages were built for workers and the workforce increased to almost 1000. The main building was reconstructed in 1887. Cloth production ceased at Bonds Mill in 1934 and Sperry Gyroscope took over the site in 1939 (Mahler 1982).

Lower Mills

No known heritage assets other than the mill site itself (NMR 115162) and two listed buildings on the northern edge of the study area described under the listed buildings section below.

In the 15th century, this was known as the Stonehouse manor mill, leased by William Carver. William Fowler owned this manorial corn mill in 1579. The mill did not become a cloth mill until sometime after 1683 when William Lye inherited the mill from his father, a miller. By 1697 the mill, with three stocks and a gig mill, was mortgaged to William Clutterbuck. In 1701 it was sold on to John Arundel and since on to the Davies family. The mill, with both water and steam power, was put on the market in 1904 and the firm of Robert S. Davies & Sons ceased to manufacture cloth in 1906 (Tann 2012).

Map regression, air photos, LiDAR data and site visit

The 1783 plan (Illus A3.1) shows the channels relating to Bonds Mill as well as meanders in the southern arm of the River Frome downstream from Beards Mill. It seems unlikely that the map makers would have gone to both the trouble of mapping these, whilst at the same time omitting the straightening of this section, and therefore it seems reasonable to presume that this section of river was straightened after the date of the map. This appears to have happened by the early 19th century and the time of the Tithe map (Illus A3.3). Here some of the old meanders have been recorded on the tithe even after straightening of the river course. The northern section of the Frome is clearly straightened as far as Lower Mills. Interestingly the plots of land above both mills are referred to as Rack Hill, with a plot at the west end giving away its former function with the name 'Brick kiln Ground'. On the northern leg both the new artificial channel and the original one appear to be active (based on the dashed lines used for inactive channels on the southern water course).



ILLUS A3.1 A Plan of the Thames and Severn Navigation Laid down from Actual Surveys by Rob Whithworth Engineer 1783

The railway had been constructed by the time of the 1886 Ordnance Survey map (Illus A3.4), although both of the northern channels appeared still to be active running beneath it. There is little change to the water courses between this and the 1938 Ordnance Survey map (Illus A3.5–8).

A more schematic plan of the canal and river can be seen in Illus thought to date to the mid-20th century (Gloucester Records Office T.S. 175(6)).

The LiDAR data again clearly shows the outlines of open field systems in the valley bottom as well as the lines of former meanders of the river. Later drainage has again been introduced across these field systems to enhance drainage in the area. The complexity of former drainage systems in the area is clearly depicted in Illus A3.8, along with changes to the lines of former river channels.







(Environment Agency Sheet 0041SW Reference 0022805W)



(Environment Agency Sheet 0049NW Reference 0022962W)



(Environment Agency Sheet 0049NW Reference 0022960W)



(Environment Agency Sheet 0049NW Reference 0022960W)



(Environment Agency Sheet 0049NW Reference 0022959W)





ILLUS A3.10 Plot of the lidar data around Bonds Mill and Lower Mills





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