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Part 8: Archaeology & Heritage of the Chesterfield Canal (and surrounding canal corridor) between Killamarsh, Derbyshire, and Kiveton Park, South Yorkshire.

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# 8 Archaeology & Heritage of the Chesterfield Canal (and surrounding canal corridor) between Killamarsh, Derbyshire, and Kiveton Park, South Yorkshire.

## 8.1 Introduction

- 8.1.1 It is proposed to reinstate the Chesterfield Canal between Staveley and Kiveton Park to a fully navigable condition.
- 8.1.2 In preparation, an archaeological study was undertaken to identify potential sites and to provide a baseline for the assessment of the potential impact of restoration upon the heritage resource.
- 8.1.3 This chapter summarises the results of that study for the section from Killamarsh Town to Kiveton Park.
- 8.1.4 This study is intended to review current knowledge of the archaeological and built heritage of the Chesterfield Canal and to place it in its local context. It attempts to identify surviving remains and heritage resources within the immediate development corridor of the canal which may be at risk from restoration activities, and proposes mitigation and protection measures which should be undertaken. It also identifies those features which might be employed to better present the story of the area, its canal and its communities.
- 8.1.5 The evidence collected will ultimately contribute towards the formulation of a heritage management plan for the canal track.

## 8.2 Aims and Objectives

- 8.2.1 The aims of this study are to (a) audit the surviving remains of the Chesterfield Canal from Killamarsh in North East Derbyshire to Kiveton Park in South Yorkshire (Rotherham Metropolitan Borough) and (b) to audit the archaeology which occurs within the environs of the canal.
- 8.2.2 The objective is to create a body of data which will:
- Guide and inform the management of the waterway's archaeological resources.
  - Enable the determination of the level of threat faced by individual features and classes of feature within the corridor and thus assess what additional protection, if any, they should be given.
  - Permit the restored waterway to be properly interpreted to the public.
  - Enable the restored waterway to be fully used as an educational resource.

## 8.3 Methods

### Desk Based Assessment

- 8.3.1 Desk Based Assessment involved examination of:
- Derbyshire Sites and Monuments Record
  - South Yorkshire Sites and Monuments Record
  - Published Archaeological Reports
  - Unpublished (Grey) Reports where in County Records
  - Primary Archive Sources (Canal Records)
  - Secondary (historical) sources; especially historical maps.
- 8.3.2 This established the baseline of known and potential sites. These records were transferred to a standard pro-forma, listed and plotted on a series of working heritage survey maps. These records were used to inform and guide the interpretation of field Survey Evidence.
- 8.3.3 The text-aided approach was dictated by the extensive changes which have recently taken place across the former coal mining landscapes. Large scale reclamation projects, while enhancing the modern amenity value of the sites, have often obscured or hidden features of great value in the understanding the area's history. The map and text-aided approach was felt to help achieve a better understanding of both the landscape's evolution and the potential for hidden features.

### Field Survey

- 8.3.4 The canal track and its immediate environs (the canal corridor) were field walked in a series of visits in 2005, 2006, 2007, 2008 and the Spring of 2009.
- 8.3.5 The canal track is the area occupied by the canal, its banks, towpath and such ancillary land as is required for the functioning of the canal – it is usually congruent with the land originally owned by the canal company. The canal track is where disturbance due to reinstatement is at its greatest and, therefore, the requirement to understand the heritage resource is most acute.
- 8.3.6 The canal corridor is defined as all land within 500m of the canal track. On the whole the canal corridor is unlikely to be affected by canal reinstatement but access across this corridor for plant and machinery may be required. An understanding of the archaeology and heritage of this wider corridor places the canal in context and enables planning to prevent damage by works access or ancillary (secondary) development unrelated to the proposed canal reinstatement.
- 8.3.7 Thanks to the co-operation of the local estates, landowners and tenants, the vast majority of the corridor has been field walked. Where there are exceptions these are noted on the survey maps.
- 8.3.8 The selection of a 500 metre canal survey corridor is arbitrary but accords with established practice in linear surveys by British Waterways and ARCUS (e.g. Survey of the Cromford & High Peak Railway, 2005). Where industrial sites or associated feeder transport systems extended beyond this corridor the corridor was extended to

enable recording of associated features. Cognisance was also taken of known archaeological sites and historic features in the surrounding area which could inform interpretation of the wider landscape.

- 8.3.9 Where archaeological features were identified these were recorded on the standard pro forma. Where standing remains were present measured sketch plans and photographic records were taken. No trial excavation was undertaken during this study; sites recommended for investigation prior to the commencement of reconstruction works are noted in the text.

### Synthesis & Discussion

- 8.3.10 Comparison of field and archival records enabled the surviving archaeological features to be linked to known activities. Comparison also indicated those locations where no surviving surface remains can be identified but where buried archaeology might be expected.
- 8.3.11 The results of the survey are presented in a gazetteer (Appendix B1) and plotted on a large scale fold out plans (Appendix Maps B). The gazetteer and plans will be available for incorporation into the Derbyshire and South Yorkshire Sites & Monuments Records.
- 8.3.12 Discussion of the results is in three parts: The first discusses the evidence for each archaeological period in the canal corridor and in the wider study area. The second then examines the archaeology of the Chesterfield Canal in detail. The third assesses the impact of the restoration of the canal on the archaeological & heritage resources of the canal corridor and sets out the archaeological strategy and mitigation measures which will be required for it to proceed.

## 8.4 Survey Results: Killamarsh Town to Kiveton Park

- 8.4.1 The results of the survey of historical records and prior archaeological records together with the results of the walk over are given as a gazetteer in Appendix B1. The locations are shown on the large fold out map M2.
- 8.4.2 The surveys have identified 136 sites within the survey area, 81 within the canal corridor and 55 within the historic canal track. These may be broken down as follows;

	Killamarsh Town	Killamarsh East	Norwood	Wales	Kiveton Park	All Lengths
<u>Sites</u>	Killamarsh to Nethermoor Lake	Nethermoor Lake to Norwood Flight	Norwood Flight	New surface route	Part new route part re-used tunnel fragment	Total number of sites by relation to Canal
within Canal Track	9	5	39	0	2	55
within Canal Corridor	47	15	2	5	12	81
Total number of sites by section	56	20	41	5	14	136

8.4.3 Of the 136 sites recorded only five (Norwood Bridge, Norwood Locks, Norwood Saw Mill & Ponds, Kiveton Park Colliery Offices and Colliery Baths) were previously recorded in the Sites and Monuments Registers of either Derbyshire or Rotherham. The 136 sites recorded within the canal corridor and canal track fall into the following approximate periods;

	Killamarsh Town	Killamarsh East	Norwood	Wales	Kiveton Park	All Lengths
<u>Period</u>	Killamarsh to Nethermoor Lake	Nethermoor Lake to Norwood Flight	Norwood Flight	New surface route	Part new route part re-used tunnel fragment	Total number of sites by period/theme
Prehistoric	0	0	0	0	0	0
Roman	0	0	0	0	0	0
Mediaeval	0	0	0	0	0	0
Post Mediaeval	2	1	0	0	0	3
Industrial: Canal	21	5	39	1	5	71
Industrial: Coal	7	7	1	1	5	21
Industrial: Other Ind.	9	4	0	0	0	13
Industrial: Domestic	15	2	1	0	2	20
Industrial: Railway	2	1	0	3	1	7
Unknown	0	0	0	0	1	0
<i>Total</i>	<i>56</i>	<i>20</i>	<i>42</i>	<i>5</i>	<i>14</i>	<i>136</i>

8.4.4. In addition the desk based assessment identified a further 89 sites, monuments and listed buildings in the area immediately surrounding and outside the canal corridor which may help to develop a full picture of historic development. These are listed in Table B2 - Gazetteer of Locally Significant Monuments & Sites Outside the Canal Corridor Survey Area.

8.4.5 The survey has so far failed to identify any archaeological features within the canal corridor which predate the mediaeval period. As will be seen from comparison outside the corridor such sites are rare in the surrounding area but not absent. It is possible that this is simply a matter of archaeological visibility. The pasture and woodlands of the Coal Measures margins through which the canal corridor at this point runs makes it difficult to identify earlier sites either through fieldwalking or aerial photography. This should be recognised in the design of the archaeological mitigation strategy.

8.4.6 Mediaeval features are equally scarce and this may reflect the local landscape and land-use patterns with a concentration of activity in settlements rather than in dispersed or isolated farmsteads. There is certainly a concentration of mediaeval and post-mediaeval activity in the surrounding villages which is reflected in the sites listed in Table B2.

- 8.4.7 The route of the canal corridor takes it away from many suitable settlement locations. The route between Killamarsh and the crest of the Coal Measures escarpment follows valleys which appear to have been well suited to mediaeval and post mediaeval milling or metal working. If this activity existed it has been over-written and masked by the canal construction and extensive coal mining. Nevertheless, the potential for precursor activities should be bourn in mind during the investigation of the flight.
- 8.4.8 As might be anticipated the archaeological survey record is overwhelmingly dominated by industrial sites. Of the 132 industrial period sites recorded, a total of 71 relate to the canal and canal based activities and 61 records relate to activities in the wider landscape. The single largest groups is coal mining (21 sites), followed by other industries (brickworks & chemical works -13 sites) and railways (7 sites). Around 20 sites are of domestic (13 sites), farming (4 sites) or religious (3 sites) origin.
- 8.4.9 As might also be anticipated, the industrial activity sites cluster along the transport corridors. The earlier smaller sites clustering along the canal, the later, larger sites being railway orientated. Outside the immediate environs of the canal and railway there are very few sites – those identified being related to supporting the transport links themselves (e.g. reservoirs and feeder leats/lades).
- 8.4.10 It should be noted that linear sites may be over represented in the above list – the canal for example is broken into a number of sections (reflecting state of preservation and visibility) and therefore appears multiple times through the corridor even though the canal represents a single historic entity where each recorded section functioned as part of a whole. Similar strictures apply to the railways recorded.
- 8.4.11 Site condition and survival is linked to subsequent land use. The paucity of surviving sites on the floor of the Rother valley is a reflection of the widespread open cast coal extraction and subsequent landscaping which created the Rother Valley lakes and surrounding Country Park. Elsewhere, the extensive “deep reclamation” of colliery sites has effectively removed all surface traces of mining including the likely survival of building foundations. This is creating the paradoxical situation that the surviving record along the canal corridor is skewed in favour of early industrial sites with relatively few 20<sup>th</sup> century sites leaving any significant structural remains.

## 8.5 Palaeoenvironmental Evidence

- 8.5.1 There is no known palaeoenvironmental evidence from the Canal Corridor between Killamarsh and Kiveton Park.
- 8.5.2 No sites have been identified in this corridor which have the potential to produce long term palaeoenvironmental records. There is limited potential for short term (recent historic period records) from:
- Norwood Wet Wood; areas of woodland marsh within the woodland have potential for short term records. As part of this wood may be ancient woodland (the Nor Wood is recorded in 1540), this may extend back into the Mediaeval period

- The sediment fills of the Woodall and Killamarsh Ponds (Norwood Canal Reservoir Ponds) may produce records for the post-canal construction period. These have great potential value for determining pollution levels and loads over the period from c.1785/86 to present.

- 8.5.3 The tremendous disturbance of the floor of the Rother Valley caused by open cast mining means that any valley fill sediment sequences in the area now occupied by Rother Valley Country Park (including Nethermoor Lake which is artificial) have been lost. Outside the canal track there is some potential for alluvial sequences and possible meander-infill sequences on the one remaining fragment of the original valley floor to the north-west of Killamarsh and this may have sub-regional significance.
- 8.5.4 Buried soils are likely throughout the canal corridor associated with earth works for the canal and industrial activities. These may provide soils, insect, pollen and plant microfossil evidence for land-use immediately prior to the deposition of the overlying material. In other words a snapshot of the 18<sup>th</sup> century landscape.
- 8.5.5 This study did not investigate any site in detail. Until this work is undertaken our picture of the likely past environment has to be extrapolated from sites outside the immediate study area. Even here the record is sparse and inference has generally to be drawn from the wider region.

## 8.6 Prehistory (from earliest times to 43 AD)

- 8.6.1 Evidence of prehistoric activity in the area is very limited. There are no previously recorded prehistoric sites or monuments within the canal corridor between Killamarsh and Kiveton Park and survey work has so far failed to locate any new sites which can be attributed to the pre-Roman period.
- 8.6.2 Outside the immediate study area the picture is also limited. To date only one small scatter of stone (lithic) tools is known on the Coal Measures in the immediately adjacent area. Located three miles to the south west on a low bluff above the river Doe Lea the small scatter of heavily patinated lithic material of possible Mesolithic age was discovered by fieldwalking in 2006 (Frank Robinson, pers. comm.). Other isolated finds of lithic artefacts (mostly un-diagnostic) are scattered across both hill ridge, valley slope and valley floor locations. These finds are in topsoil and in most cases appear to be re-worked into secondary contexts. Typical of these isolated finds are those noted during fieldwalking by Arcus (1994) and the Staveley Heritage Project or discovered in undated or poorly secured (and almost certainly secondary) contexts during excavations at the site of Staveley Old Hall (Frank Robinson, pers.comm.).
- 8.6.3 Further west across the Coal Measures topography of the western flank of the Rother valley, the density of known Mesolithic sites remains low. It is only where the coal measures rise up to the Millstone Grit “Edges” of the Derbyshire East Moors (which form a fringe around the Limestone White Peak) that there notable concentrations of lithic material and possible activity.
- 8.6.4 To the east of the study area the picture on the Magnesian Limestone is markedly different. The Magnesian Limestone plateau has many late Palaeolithic and Mesolithic lithic scatters including notable sites around three miles from the study

area at Lob Wells and Thorpe Common. Further south-east is the internationally important site of Creswell Crags which has produced evidence of human activity from the Middle Palaeolithic to the present.

- 8.6.5 The difference in the number of known sites between Coal Measures and Magnesian Limestone may simply reflect issues of archaeological visibility – the Magnesian Limestone Soils are largely under arable cultivation and thus easily field-walked while Coal Measure soils tend to be under pasture and thus opportunities for field-walking are limited. However, where sites have been located and excavated there does appear to be genuine difference in the size and scale of the scatters suggesting that the limestone areas were favoured over the coal measures.
- 8.6.6 Taken as a whole, the distribution of evidence suggests relatively small scale activity on the eastern flank of the Rother Valley during the Mesolithic. This may reflect differences in geology, soils and vegetation cover. The palaeoenvironmental evidence suggests that during the later Mesolithic the Coal Measures were covered in dense oak woodland grading into alder carr on the floor of the Rother Valley. To the east the Magnesian Limestone Plateau was covered in a relatively open lime and ash woodland with areas of hazel and alder along small streams. Areas of open ground habitats existed along the Markland Grips, Anston Gorge and Creswell Crags. To the west the Millstone grit had already developed areas of blanket mire and had much lighter “heathy” woodlands of birch and hazel with an understory of heathers. In the latter areas there are suggestions of the Mesolithic use of fire ecology to manipulate the landscape to improve hunting (cf. Coles 1988).
- 8.6.7 A similar spatial differentiation in activity appears during the Neolithic and Early Bronze Age. Again there are no known sites in the study area and its immediately adjacent valley flank, but a number of sites are known to both the west and east. These include to the east the Neolithic chamber tomb at Whitwell, several Neolithic burials within the Creswell Caves and to the west the stone circles and burials on the grit-stone Edges and Moors.
- 8.6.8 The palynological evidence points to relatively early arable agricultural clearance in both the East Moors, Peak and the Magnesian Limestone areas. There is little evidence for clearance of the Coal Measures lowlands and Rother Valley at this time. Over time the East Moors show evidence for the cessation of arable agriculture and the onset of extensive blanket peat formation, possibly in response to more oceanic climatic conditions.
- 8.6.9 The later Bronze Age and Iron Age settlement shows a regional trend towards the creation of distinct settlement hierarchies with small scale “farmsteads” and larger nucleated settlements enclosed by defences. Again there is no archaeological evidence for this in the study area but the hillfort at Wincobank eight miles north and the Markland Grips “promontory fort” enclosure settlement-site five miles to the east may be locally indicative of this trend.
- 8.6.10 The palynological evidence for the early Iron Age suggests intensifying agricultural activity on the lighter soils of the Magnesian Limestone areas as demonstrated by the renewed clearance of secondary (largely ash) woodland and increased incidences of cultivated or crop plants. This is reflected in the exceptional air photographic record of settlement on the Magnesian Limestone which shows a high density of farmstead sites (e.g. Riley 1980) . At the same time the palynological

record shows the first significant clearances of the lowland oak woodlands on the Coal Measure lowlands to the west suggesting expansion into these formally marginal areas driven by the regional population growth and the “filling up” of the good-soil landscapes and also, possibly, by technological or social innovations which enabled better use to be made of the heavy soils in the Coal Measures lowlands.

- 8.6.11 Taken overall there is an absence of all types of prehistoric evidence from the surveyed canal corridor. This may well be an artefact of the masking effects of heavy industry or of the relatively limited fieldwork carried out compared with the “hotspots” of the Limestone areas. Given, however, that several other independent studies (ARCUS, T&PAT, SYAS et al) have also failed to reveal evidence for extensive prehistoric activity in this length of the Rother Valley, it is possible that the absence of evidence may be evidence of absence.
- 8.6.12 Why this should be so is unclear. It appears likely that the geology, soils and vegetation cover may have been a factor. The density and dampness of the likely vegetation cover in the valley may have made for poor hunting and would have been difficult to manipulate through fire ecology (unlike the light heathland woods to the west) or those on the better drained limestone soils to the east. Similarly the soil types present are heavy and hungry and not well suited to early prehistoric cultivation methods. The soils on the Magnesian Limestone to the east in particular are of very high quality and would have been far preferable for arable agriculture. The topography of the valley itself is unforgiving and is heavily internally dissected making movement difficult. The earliest known route ways (below) avoid the lower slopes and valley floor which make up the canal corridor and keep to the valley tops and ridges; a pattern mirrored by most modern roads.
- 8.6.13 It is also possible that, together with the lower Don Valley, the Rother Valley functioned as a long term boundary between different traditions or groups. It seems likely that in Late Iron Age times, prior to the Roman invasion, the land to the west and north of the Rother-Lower Don line was the territory of the Brigantes (“the hill people”) and the land to the south and east is the territory of the Corieltavi (Coritani). It has been argued that the positioning of the early Roman forts long this line (Chesterfield - Templeborough – Rossington - Doncaster) reflects this border between the client Corieltavi and the yet to be subjugated (and always troublesome) Brigantes.
- 8.6.14 In conclusion, whatever the cause, the general paucity of earlier monuments together with the only sporadic and isolated finds of prehistoric pottery and stone tools in the study area point to a relatively low density of prehistoric land use and settlement.
- 8.6.15 This pattern is repeated across much of the Coal Measures landscape around the Rother Valley and contrasts strongly with the vibrancy of prehistoric settlement and activity across the Magnesian Limestone lands immediately to the east. There is some suggestion from air photographs (Riley 1980) that the Magnesian Limestone area became more densely settled in the later pre-Roman Iron Age and this may have led to expansion into the Coal Measures lowlands.

## 8.7 Roman Period (43 – 410 AD)

- 8.7.1 The study area has no recorded Roman sites although there is evidence for extensive Roman activity in the surrounding area.
- 8.7.2 In the wider region, Roman forts were located to the north at Templeborough (near Rotherham), to the north east at Doncaster (Roman *Danum*), Rossington, Austerfield & Bawtry and to the south at Chesterfield. Of particular regional importance was Roman *Danum* which was an auxiliary fortress on the alternative route from Lincoln to York via Bawtry and latterly developed an extensive civilian or vicus settlement with several significant buildings (Buckland 1986).
- 8.7.3 It is assumed that the Roman forts at Chesterfield and Templeborough, near Rotherham, were linked by a road which may have passed through or near this study area. The route has been much debated and one possible alignment near Hagge Farm, Staveley, identified on aerial photographs, but to date no definite physical evidence has been forthcoming. It is possible to suggest two parallel routes – a Chesterfield to Templeborough Road following the high ground on the west side of the Rother Valley and a second, possibly older track, east of the Rother following the crest of the Coal Measures escarpment. The latter, Hay (2003) identifies as the Roman Ricknield (or Rycknield, Rykenield or Ryknild) Street noting that the modern settlement to the south east of the bridge, now known as West Thorpe, was in the thirteenth century known as Ricknieldsthorpe.
- 8.7.4 The probable line of Ricknield Street from the south is today taken by a modern road, Packman Lane, which crosses the later canal line at Dog Kennels Bridge just outside the study area. Excavations on the road line have revealed traces of a cobbled surface in two locations (MN318676/NMR SK58 SW8).
- 8.7.5 To the north east of Dog Kennels Bridge an extension to the limestone quarry uncovered evidence of a first or second century Roman ditched site, containing pottery, domesticated animal bone and a corn drying kiln (MN318693 / NMR SK58 SW19). The pottery finds are of a type usually associated with early military contexts and it is suggested that the likely context is a vicus attached to a temporary military site restricted to the period 80-130 AD. The site is located on a limestone knoll (SK 507 828) on a south facing slope on the line of a probable Roman Road and is a not unreasonable location for a Roman auxiliary fort (Radley & Plant 1967, 1969, Buckland 1986).
- 8.7.6 Coins of Claudius, Hadrian, Vespasian and Severus have been found in Harthill Parish, several near the border with Norwood in the 1880's (MN316385 / MNR SK48 SE3), while a 4<sup>th</sup> century Roman coin was discovered near Killamarsh Pond in the 1960's (MN316408 / NMR SK48 SE10). Regrettably the exact find spots and contexts are not known but they do serve to demonstrate that activity in the Roman period was widespread across this area.
- 8.7.7 To the east and north-east of the study area there is extensive evidence for Roman farming and settlement activity both on the Magnesian Limestone and on the alluvial lands of the lower Don and Trent valleys. The Magnesian Limestone belt in particular has produced evidence for small villas at Stancil (near Tickhill), Clifton (near Conisbrough) (both in South Yorkshire) and Styrrup with Oldcotes (in North Nottinghamshire), together with air photographs which show large numbers of small farms and field systems apparently dating to the late Iron Age and Roman period (Riley 1980). Romano-British enclosures comparable with the crop mark sites have

been recorded in Edlington Wood (near Conisbrough) and Swinston Hill & Smarson Hills (near Anston).

- 8.7.8 The Romano-British settlement at Smarson Hills (SK 520825), 2 km east of the study area, demonstrates the range of activity which was going on in this area during the Roman period (MN318686 / NMR SK58 SW12). Fieldwork recorded a series of enclosures and field walls associated with 3<sup>rd</sup> to 4<sup>th</sup> century pottery, saddle and rotary querns, pot boilers, animal remains and iron slag, charcoal and ironstone together with a pair of iron nails. A smaller site 450 m west in Snape Close Field produced a whetstone and fragments of flat rotary quern in an area 50 m across. (Hunter Society 1969).
- 8.7.9 Fairly intense land use on the Magnesian Limestone in this area is also indicated by the density of crop mark sites seen in aerial photographs both north and south of the study area. A possible Romano-British rectilinear enclosure around 104 m wide with associated ditch system has been recorded 3km north of the study area centred on SK 5041 8574 (MN1437894 / NMR SK58 NW28).
- 8.7.10 To the south east of Harthill (3km from the Study area) a complex sub-circular enclosure system has been recorded which has a similar typology to the that seen at Smarson Hills and Edlington Wood and is more confidently thought to be of Romano-British age (MN1025549 / NMR SK48 NE23). The crop marks show a ditched sub-circular enclosure with an incomplete circuit and measuring 74 by 65 m (centred on SK 4988 8652), together with two parallel ditches approaching the enclosure from the north east. One appears to terminate on the enclosure ditch, while the other terminates on another ditch which abuts the enclosure ditch. Further Crop mark sites were noted in the same general area, including a possible pit complex centred on SK 5078 7983 (MN1430669 / NMR SK57 NW39).
- 8.7.11 Taken together this evidence suggests a complex landscape in which native traditions were gradually supplemented by adopted styles of settlement. Certainly the villas, while possessing all the key characteristics of southern villas (tessellated pavement mosaics, hypocausts etc), are on a much smaller scale and do not seem to sit at the centre of large estates as do their counterparts elsewhere. Further, the villas occupy similar locations in the landscape to the earlier settlement sites and fit within the earlier landscape framework – they suggest the acculturation of local populations rather than social or economic imposition.
- 8.7.12 Settlement on the adjacent Coal Measures is harder to trace as the air photographic evidence is less forthcoming and the landscape has generally undergone far greater disturbance since the Roman period. Nonetheless there are examples of settlement sites, such as the Romano-British enclosure in Canklow Woods (Sydes 1991), which suggests widespread activity by the end of the Roman period but at a lower density than that seen on the Magnesian Limestone. Notwithstanding differences in archaeological “visibility”, it does seem probable that during the Roman period the Magnesian Limestone to the east of the study area supported a denser population than the Coal Measures in the Rother Valley to the west. The most likely reason is the inherent difference in soil quality and fertility.
- 8.7.13 There is a suggestion of domestic scale industrial activity on the northern Coal Measures in the form of smithing hearths and small iron furnaces and the quarrying of quern stones at Wharnccliffe Edge in Sheffield. To the north-east the area around

*Danum* supported an extensive (near industrial scale) pottery industry whose products are found throughout northern Britain (Buckland 1986).

- 8.7.14 There is also abundant evidence of Roman industrial activity to the west and south west - most notably lead and silver mining in the Limestone Peak District (the White Peak) and iron working on the Carboniferous Coal Measures around Chesterfield. Interestingly, much of this activity is embedded in domestic contexts, for example, at Bolsover a Romano-British oval enclosure contained a defined area apparently dedicated to iron smithing (Jones 1995).
- 8.7.15 While there is a paucity of evidence in the study area, it is clear that there was Roman activity in the surrounding landscape. Across the region as a whole the majority of the Roman period was an era of relative prosperity and it would not be unexpected that finds of Romano-British or Roman origin will be made in the canal corridor. Of particular interest is Nor Wood which is classed as ancient woodland and could, as at Smarson Hills, preserve evidence of earlier settlement.

## 8.8 Post-Roman to Mediaeval Periods (c.410 – 1540 AD)

- 8.8.1 There are no recorded early post-Roman sites in the canal corridor – a scarcity which is reflected throughout much of North Derbyshire and South Yorkshire. In South Yorkshire there is some evidence of early Anglo-Saxon activity centred on Consiborough to the north, the recent discovery of a cemetery site at Adwick-le-Street near Doncaster together with a scatter of later Anglo-Saxon elements in churches such as All Saints Church, Laughton en le Morthen (MN318559 / NMR SK58 NW6) and All Saints Church, Rotherham (MN54145 / NMR SE40 SW11).
- 8.8.2 The place name evidence (notably the roots of Killamarsh, Wales, Harthill and of Kiveton) does, however, suggest a significant Anglo-Saxon presence as does the Domesday record.
- 8.8.3 The first mention of Killamarsh is in Domesday Book, compiled in the 11th century, which gives two references, recording the name as Chinewolde and Chinewoldemaresc respectively:
- 8.8.4 *“The Land of Hascoit Musard ... In Chinewolde Alweald had half a bovate of land to the geld. It is waste. There is half an acre of meadow, [and] woodland pasture 1 league long and 30 perches broad. TRE (In the time of King Edward, i.e. before the Norman conquest) worth 16d; now 12d.”* (Williams & Martin 2002 p.753)
- 8.8.5 *“The land of the King’s Thegns... In Chinewoldemaresc Godric [...] and Eadric and Thorgisl had 7 1/2 bovates of land to the geld. [There is] land for 1 plough. There now 5 villans have 1 plough. There are 7 acres of meadow, [and] woodland pasture 3 leagues long and 5 furlongs and 70 perches broad. TRE worth 18s; now 9s.”* (Williams & Martin 2002 p.754)
- 8.8.6 The place name itself is Old English, comprising the personal name Cynewald and maresc meaning a marsh (Cameron 1997). The name suggests that Killamarsh remained in Anglo-Saxon hands after this area became part of the Danelaw. Of the names in Domesday only one, Thorgisl, is of Scandinavian origin suggesting that Norse settlement or influence in this area was limited.

- 8.8.7 In this regard the “Thorpe” place names at West Thorpe and Upper Thorpe are equivocal as to origins as Thorp may be derived from either the Old Norse *þorp* or the closely-related Old English *þrop*. Both mean a dependent outlying farm or village – presumably of Killamarsh as they are within that parish.
- 8.8.8 The origin of Kiveton is debated but may mean “the settlement in the hollow” from the Anglo-Saxon “kyfe” meaning dish or hollow vessel and “ton” meaning stockaded camp. Domesday in 1086 records the hamlet as “Cieutone”.
- 8.8.9 One exception to this Anglo Saxon place name theme is the village of Wales which is first recorded as *Walesho* in 1002 as the property of the Saxon thegn *Wolfric Spot*. The name is probably derived from the Anglo Saxon for “strangers” or “others” (i.e. a non Saxon speaker) and may reflect a continuation of an identifiably separate Romano-British or British settlement with its own linguistic or cultural traditions into the early Anglo Saxon period.
- 8.8.10 Whatever the origins of their names, all the settlements around the canal corridor are recorded in Domesday and suggests a well settled landscape by the time of the Norman Conquest. The descriptions of agriculture yielded by Domesday and the local place names (mutable that they are) suggest that around 1080 AD the landscape of the Magnesian Limestone and the fringes of the Coal Measures on the escarpment dip slope was open with extensive ploughlands, some arable and limited woodland pasture and woodland. To the east on the Coal Measures scarp slope (the eastern flank of the Rother Valley), the landscape had less ploughland but a greater preponderance of arable, woodland pasture and woodland. In both areas woodland was intensively managed and rights fiercely contested. The floor of the Rother Valley was wet pasture, marsh and wet woodland (carr).
- 8.8.11 This pattern appears to have persisted through the Mediaeval period and to some extent persists even today. The western half of the study area (the climb from Killamarsh to the M1 Motorway) is predominantly pasture and woodland; the eastern half (from the M1 Motorway to Kiveton Park) is predominantly open arable agriculture with isolated woodland copses.
- 8.8.12 Of the five main modern settlements on and around the Canal corridor – Killamarsh, Wales, Kiveton, Woodall and Harthill – three have recognisable mediaeval cores in the form of their Parish Churches. Killamarsh, Wales and Harthill all have churches with identifiable early Norman elements which probably replaced earlier churches in the same location. At Killamarsh the Church of St Giles has a Norman entrance doorway arch. At Harthill, All Hallows Church contains several fine Norman arches and window openings and at Wales the original Norman Church now forms the north aisle of the present Church.
- 8.8.13 This is a common pattern in south Rotherham - further north at Todwick, for example, the Church of St. Peter and St. Paul has an 11<sup>th</sup> century nave, while Churches at both Anston and Laughton-en-le-Morthen have Norman elements. In common with much of south Rotherham and North Derbyshire, all the local churches were later extensively rebuilt.
- 8.8.14 The Church of St Giles at Killamarsh (MN316399 / NMR SK48 SE7) incorporates Perpendicular window and was extensively rebuilt during the 14<sup>th</sup> and 15<sup>th</sup> century. Further alterations were made in 1895 when the Chancel was reconstructed (Pevsner 1985).

- 8.8.15 Although the origins of All Hallows at Harthill (MN316402 / NMR SK48 SE8) lie around 1080 when the Manor of Harthill passed to Earl William de Warenne (son in law of William the Conqueror), the majority of the church is early English (roughly 13<sup>th</sup> century) and the tower largely 15<sup>th</sup> century. It also was much restored in the 19<sup>th</sup> century (Pevsner 1959).
- 8.8.16 St.John the Baptist's Church at Wales (MN316396 / NMR SK48 SE6) (SK 4775 8267) incorporates the original Norman Church as the north aisle. The tower and Chancel were added in 15<sup>th</sup> century and a new nave and south aisle were added in 1897. The new chancel was only finally completed in 1933 (Pevsner 1959).
- 8.8.17 Wales was clearly a place of some local importance as, in addition to its church, it hosted a Chantry Chapel (MN316388 / NMR SK48 SE4). Founded in the reign of Edward III it was dissolved in 1538. There are no visible remains but it is thought to have been located where Joe Lee's Corner now is (SK 4974 8294). The name Chantry Place is modern and not related.
- 8.8.18 Neither Woodall nor Kiveton had their own churches. From 1080 to 1868 Kiveton was a hamlet of the village of Harthill-with-Woodall. In 1868 it was transferred to Wales Parish. Woodall remained part of Harthill.
- 8.8.19 Demonstrable Mediaeval buildings are rare, but more possibly await discovery beneath later renovations and additions - the local tradition of encasing older buildings with stone or brick curtain walls can make mediaeval buildings especially hard to identify. Sometimes the mediaeval timber frame on which a building is constructed only becomes evident when the stone or brick walls are demolished.
- 8.8.20 Elsewhere in South Yorkshire and where dating evidence from tree ring dating (dendrochronology) is available, there is a clustering of construction in the 15<sup>th</sup> century at roughly the same time most churches in the area were being rebuilt and in most cases enlarged. This suggests relative prosperity at this time (Hay 2003).
- 8.8.21 Hay also notes that cruck frame construction continues into the 16<sup>th</sup> century and later in this area, long after they were replaced with parallel frames elsewhere.
- 8.8.22 One of the few proven early buildings is in Woodall. Here a late medieval farmhouse was encased in stone walls in the late 17<sup>th</sup> or early 18<sup>th</sup> century and was subsequently further altered. The roof contains a crown post truss above what would have been a central open hall – an almost unique survivor in this region. The quality of the structure and the surrounding field names suggest that this may have been a minor manor house. A manor is not recorded at Woodall although the name does appear in mediaeval documents as a surname possibly suggesting a manorial connection.
- 8.8.23 Taken as a whole there are a paucity of medieval structures within or close to the study area. Many of the grand houses of the region (such as Kiveton Hall) are thought to have mediaeval precursors but these have been lost in subsequent rebuilding and over-building.
- 8.8.24 While mediaeval buildings in the study area are apparently rare, evidence of mediaeval origins can be found in the village plans. In Wales and Harthill the mediaeval origins are very apparent in the layout. In each case the core of the village is orientated along a north-south spine road off which are laid a series of long thin toft, croft or burgage plots extending from the axial road to the village boundary.

The plots would have originally had a building on the street line with workshops or farm yards along the line of the plot. These structures have long gone and have been replaced by more recent buildings but the pattern of land ownership (sometimes with two or more strips consolidated) remains visible.

- 8.8.25 The layout at Woodall is also axial but here the plots are more irregular and were, until the early 20<sup>th</sup> century, only on the east side of the road. Killamarsh is interesting in that its heart, around St.Giles, is more irregular with land ownership in the village core in clumps rather than narrow strips. While it is possible that a burgage pattern has been completely obscured, it seems likely that the village was never lotted into plots either because the village was too insignificant (unlikely because of the scale of the Church) or because the village plots were already well established before the Mediaeval vogue for town planning.
- 8.8.26 What is apparent, however, is that the basic mediaeval settlement pattern of the area was clustered. Dispersed settlement or isolated structures appear to have been rare. Unlike many other areas there is only limited evidence for settlement contraction during the 14<sup>th</sup> century and no evidence for settlement abandonment. Overall there appears to have been a fair degree of continuity in settlement pattern from the Medieval period to the present. The potential for the discovery of abandoned buildings or settlements in the canal corridor therefore appears slight.

#### The Mediaeval Agricultural Landscape

- 8.8.27 Documentary evidence show very complex patterns of land holdings around Killamarsh, Wales and Harthill. All three villages operated an open field system and in some cases the allocation seems to be based on the degree of sun exposure of the land with parcels divided to give a share of the shady and sunny slopes (*solskifte* or sun-division). This also applied across parish boundaries - until the 19<sup>th</sup> century both Harthill and Wales parishes have a strong degree of interlacing of land ownership with detached portions of the parish lands being found in opposing parishes (Hay 2003).
- 8.8.28 As previously noted, woodland holdings were of particular importance and were managed for timber, charcoal and wood-pasture. The latter being especially important in the Coal Measure parishes. The Nor Wood at Killamarsh appears both in the Domesday book and in the records of the sales of monastic lands. Following the dissolution of Roche Abbey in 1538, its land holding at Norwood was sold by the crown to Henry Tyrell, gentleman, in 1546. At that time it was described as "coppice with standards" and of 20 acres (Hay 2003). The wood still stands on the south side of the canal line.

#### Mediaeval Industry

- 8.8.29 The evidence for medieval industry in the study area is slight and largely based on documentary sources.
- 8.8.30 Coal mining is recorded in South Yorkshire in several documents from Domesday onwards. The coal in Wales Parish is notably close to the surface and was being won by open pits and bell pits by the 14<sup>th</sup> century. Notable concentrations of works appear in the Waleswood area around 2.5 km from the canal corridor.

- 8.8.31 Efforts have been made to identify early coal workings within the canal corridor but so far with little success. This is partly due to the extensive impact of 19<sup>th</sup> and 20<sup>th</sup> century coal mining and the even greater impact of recent “brownfield remediation”.
- 8.8.32 Several pits identified by map regression have proved to be of very late 18<sup>th</sup> and early 19<sup>th</sup> century origin. No pits on the canal track or in the canal corridor have been proven to predate the 18<sup>th</sup> century. Several pits identified in previous technical surveys can be shown to be the remains of construction shafts for the very much later Norwood Tunnel (see below).
- 8.8.33 Iron working and the associated coppicing of timber and charcoal burning is known in the North East Derbyshire / South Yorkshire area from the 13<sup>th</sup> century onward. The early ironworking sites at Foxbrooke Furnace near Eckington and Smithy Brook near Renishaw both have claims to mediaeval origins. Unfortunately these sites have now been lost to opencast coal extraction and to redevelopment.
- 8.8.34 No evidence for mediaeval ironworking has come to light in the canal corridor nor indeed in the immediate surrounding area. There is some documentary evidence for the coppicing of timber to provide charcoal for metal working in relation to Nor Wood at Killamarsh (Hay 2003). Recently archaeological trial excavations in advance of development in Wales have revealed deposits of iron working waste in Mediaeval contexts at Grange Farm on the west side of Church Street. It is uncertain what activity was being undertaken but the quantity of spelter suggests a possible bloomery or forge. All three local villages had village blacksmiths until recently.
- 8.8.35 Other industries such as milling and cloth weaving are known only from name evidence and poll tax records. For example, in 1379 Harthill had two weavers and Wales a cloth maker. This suggests a fairly diverse local economy.

## **8.9 Post-Mediaeval Period (1540 – 1750 AD)**

- 8.9.1 The post-Mediaeval period is here considered to extend from the dissolution of the Monasteries to the onset of the Industrial Revolution – two events which – in different ways – were to transform English culture and landscape.
- 8.9.2 Few remains of definite post-Mediaeval date have been recorded in the field survey of the canal corridor, however, the period is well represented in the surrounding area.
- 8.9.3 The reformation has a significant impact on the lands held by the local religious houses such as Beauchief Abbey, Roche Abbey and the priories at Blyth, Lewis, Worksop and Ecclesfield. From 1538 onwards the lands were progressively sold off and land holdings which had been assembled over centuries were dismantled. The documents recording the distribution and sale of lands to the gentry reveal the complexity of the holdings of the religious houses and the varied activities which took place within them. Many of the industrial activities which were to play a key role in the area in the Industrial period have their origins in this period – as noted with respect to the woodland holdings of Roche Abbey at Norwood.
- 8.9.4 The impact on religious houses is also witnessed locally. For example the chantry chapel in Wales was dissolved 1538 (the fate of the building is unclear although it

had been replaced by domestic buildings by the 17<sup>th</sup> century) and the ancient churches undergo internal change with alterations in the layout, most notably the installation of benches and pews.

- 8.9.5 For domestic architecture the upheavals of 1538 are less sharply felt. The earliest post-Medieval domestic structures continue the Mediaeval traditions. The farmhouse on Walseker Lane, Woodall, has construction features which are directly descended from Medieval hall houses although most of the visible work seems to date from the 1600's.
- 8.9.6 In Harthill the main standing buildings in the village core date to this period. Of those with records in the SMR, Walkers Butchers started life as a Threshing Barn in the late 1600's, the Old Rectory also dates to the late 1600's. The Old School is early 1700's as is the Glebe Farm. All were subsequently rebuilt and extended in the 18th and 19th century.
- 8.9.7 A similar pattern can be seen in Wales where many of the existing buildings along Church Street have origins in the early post-mediaeval period. Number 22, Step Cottage, dates back to the late 1500's the majority, however, have cores dating to the late 1600's or early 1700's.
- 8.9.8 Many other structures in the old village cores of Killamarsh, Wales, Woodall and Harthill probably contain Tudor, Stuart, Commonwealth or Restoration elements hidden beneath Georgian and Victorian facia or extensions.

#### The Post Mediaeval Agricultural Landscape

- 8.9.9 Although the ownership of land changed, the patterns of land-use continued much as they had done before. The general view, summarised in Hey (2003) is that the landscape in this area underwent gradual development rather than wholesale revolution.
- 8.9.10 For much of the Post-Mediaeval period the villages maintained their open field traditions. In this area private agreements to enclose or group holdings together took place on the Coal Measures lands from the 1650's onwards while the Magnesian Limestone villages tended to retain their open system much later and were typically not enclosed until forced to do so by Acts of Parliament between 1750 and 1850.
- 8.9.11 Around Killamarsh enclosure took place relatively early and clearly fossilises the earlier strip boundaries (and can still be seen in the local field patterns). In consequence the canal cuts across the strip pattern. In other areas (in Nottinghamshire for example) the canal clearly predates the post enclosure field pattern and was used as a key boundary element in setting out the landscape.

#### Grand Houses

- 8.9.12 The Post-Mediaeval period saw the rise of grand country houses which became focal points in the landscape in direct replacement of the old order of Abbeys, Priors and Granges.
- 8.9.13 There are no grand houses on the route of the canal but in the immediate surrounding areas there were notable houses at Kiveton Park (the home of the Duke of Leeds) and Thorpe Salvin Hall. Both have now been demolished but the

substantial ruins of the Elizabethan house at Thorpe Salvin still stand and give some idea of the importance the Hall.

- 8.9.14 Smaller houses with modest pretensions to grandeur can also be found in the villages. The best example is Wales Court in Wales which dates to 1629 and was originally built for the Duke of Leeds.

#### Post-Mediaeval Industry

- 8.9.15 Post-Mediaeval industrial activity appears to have been widespread. Assessing its full extent is difficult as the majority of the sites later exploited during the Industrial period seem to have their origins to the Post Mediaeval period. This can make identification of the pre-industrial precursor difficult and is possible that the density of Industrial period sites is masking earlier works.
- 8.9.16 By the late mediaeval period the South Yorkshire and North East Derbyshire area had already acquired a reputation for iron working and in particular the manufacture of blades and edge tools.
- 8.9.17 Early Post-Mediaeval iron working in the wider area is represented by the Elizabethan ironworks at Smithy Brook, Renishaw (which may have a Mediaeval precursor), and Foxbrook Furnace to the south (Riden 1993).
- 8.9.18 From the 1550's onward the Rother Valley area was especially noted for blade and sickle manufacture. An important early site for sickle manufacture was at Chapel Wheel Dam to the south of Killamarsh. It is possible that a site of this type may lie under the canal works at Norwood. While the topography is suitable there are no records of compensation being paid to a prior owner in the Canal Company Minute Books. In other locations on the Chesterfield Canal considerable compensation was paid to mill and forge owners for interruption of water supply, as there is no record for such compensation or purchase of rights at Norwood it would appear probable that there were no functioning works on the route by the time the canal was constructed.
- 8.9.19 Coalmining is well recorded throughout the area during the post Mediaeval period. Numerous early coal pits throughout the area (most notably at Aston, north of the canal corridor).
- 8.9.20 The importance of water power to the post-mediaeval economy is emphasised by the presence of Bedgreave Mill to the north west of the canal corridor. Bedgreave underwent successive redevelopments from the 1600's onwards and grew to be one of the major mills in the area probably because of the reliable water supply provided by the Rother. Most of the brooks in the area are small and are not well suited to supplying a mill. The canal corridor survey did not locate any other mills in the immediate area although there are possible windmill sites to the both the south and north.
- 8.9.21 Other activities are recorded in documentary sources but again indicate a continued diverse craft economy. Physical evidence for these activities is so far elusive but, in the absence of research excavation in the village cores, is unlikely to be found.

#### Post Mediaeval Transport

- 8.9.22 The Post-Mediaeval period saw progressive development in transport. Over this period, from the 1680's onwards, the lower reaches of the River Dun (now called the River Don) were improved and it became possible to bring sea going boats to the edge of Doncaster town.
- 8.9.23 Between 1702 and 1722 several plans were put forward to extend navigation to Rotherham and Sheffield but it was not until 1751 that boats could reach Tinsley (Willan 1965).
- 8.9.24 During this period much of the trade of South Yorkshire and North East Derbyshire was taken overland by packhorse and cart to Bawtry. Bawtry gave access to the Lower Trent and the Humber and thus markets in the lowlands of Holland, North Germany, Scandinavia and the Baltic as well as providing a route to London and the south of England by coastal shipping.
- 8.9.25 At the start of this period Bawtry remained one of the most significant ports in Yorkshire but over time its influence and significance declined. This appears to be due the improvement of alternative routes to the North Sea, the silting of the River Idle upon which the port depended, the growth in size of ships and also a lack of investment in suitable facilities by the port's owner.
- 8.9.26 Several important trade routes passed through the area. The main packhorse trails from Chesterfield and Sheffield passed west to east towards the port of Bawtry (see Hey 1980). It was this trading connection between the emergent industrial areas of North East Derbyshire and the lowlands of the Trent Valley with their North Sea trade links which was ultimately to drive the construction of the Chesterfield Canal.

## **8.10 Industrial Period (post 1750 AD)**

- 8.10.1 The archaeology the Industrial Period is, unsurprisingly, the best represented along the canal corridor and can be divided into four principle groups of monuments;
- Those associated with the Chesterfield Canal
  - Those associated with Railways
  - Those associated with Coal Mining
  - Those associated with Other Industries & Activities
- 8.10.2 The archaeology of the Chesterfield Canal is discussed in detail in section 8.11 below.
- 8.10.3 The modern landscape is underpinned by this heritage. The structure of the landscape seen today was almost entirely created between 1770 and 1900.
- 8.10.4 This richness of material has ironically contributed to its recent rapid loss. Sites were not listed as they were locally common – in consequence many sites have been lost through “reclamation”. It will be seen from the Gazetteer that many large sites have effectively been completely removed.

## Coal Mining

- 8.10.5 Coal mining is the largest industrial influence on the study area and many features relate to the development of the mining industry. Several “old shafts” relating probably dating to late 18<sup>th</sup> and early 19<sup>th</sup> century shallow mining are shown on the Sanderson map of 1834 and OS maps of 1854 and 1870. In some cases the site of the shaft is marked by surface features such as annular spoil tips or short-run spoil tip fans (known locally as “footrills”). Most sites recorded on earlier maps in this area have, however, been infilled and few surface features remain.
- 8.10.6 More evidence for early small pits can be gained from aerial photographs. Crop mark and soil mark evidence for bell pits has been noted south of Killamarsh at Comberwood Farm. The photographs show an area of probable post-medieval coal mine workings, including bellpits, on the south side of the Spinkhill road, approximately 0.8km south-west of the site of the Comberwood Farm colliery. Workings extended beyond the surviving remains into the adjacent fields to the south and west, and show as soilmarks. Large bellpits survive at the northern end of the area of workings, centred on SK 461 795. Linear ditched features probably mark former tramways to facilitate the mining.
- 8.10.7 Coal occurs close to the surface in Wales and the shallow seams were worked by Bradenstoke Priory in the Middle Ages. In the same area by 1598 the mines owned by Hewet Osborne were producing 2,000 tons a year (Hey 2003). These collieries were later further developed by the Duke of Leeds. There was also a small colliery at Waleswood in the 18<sup>th</sup> century which subsequently developed into a larger undertaking during the late 19<sup>th</sup> and early 20<sup>th</sup> century.
- 8.10.8 Killamarsh also has evidence for a range of early coal pits and collieries. The location of some such as Comberwood Colliery and Ironstone Mine is well documented and there are surviving surface remains. Other pits are harder to trace, Killamarsh Colliery, for example, is variously described in 1831 (Glover) as being “½ mile north west of the church” and also being “south of the church”. While this hardly inspires confidence in the ascription of documentary names to features on the ground, it does serve to illustrate that many of the earlier descriptions refer to a general notion of “collieries” as applying to the winning of coal from a number of shallow pits in a general area rather than a specific shaft or pit.
- 8.10.9 To date the survey has identified around ten probable early shallow mines within the canal corridor. None occur within the proposed canal track.
- 8.10.10 The corridor also contains the remains of three 19<sup>th</sup> century collieries. Of these mines the first two, Norwood and Kiveton West almost certainly developed from earlier mines on the same location and for which all evidence has been lost. The last, Kiveton Park Colliery, does not appear to have had any precursors. The collieries in order from west to east are:-

### Norwood Colliery

- 8.10.11 Arguably the earliest as it owed its origins to shallow coal pits worked for the Duke of Leeds. New much deeper shafts were sunk and pumping and winding engines were installed in the 1860's when it came under the control of the Sheepbridge Coal Company. The new Norwood Colliery was connected to standard gauge railway from its opening (the MR Norwood Siding or Killamarsh Branch). The earlier coal

pits had used the canal for coal transport and the new colliery retained a canal wharf until the First World War. The colliery site has been very effectively cleared and the location is now occupied by the Norwood Industrial Estate and a scrap metal yard. Only the colliery canal wharf remains.

#### West Kiveton Colliery

- 8.10.12 The most poorly recorded of the three pits. The colliery has no known precursors and was again rail connected from the outset. It also had a colliery wharf on the Chesterfield Canal (on the upper side pond within the Norwood Flight) which was still active (tramway rails in place) at the time of the Fowler Survey. The colliery was closed by 1931 although the main shaft remained open for ventilation for some time after.

#### Kiveton Park Colliery

- 8.10.13 At the eastern end of the study area and the most recently closed. The Colliery was sunk as a deep mine intended to reach coal well below that taken by the other collieries and coal pits in the area. Opened in 1866 it was a very advanced operation for its time. Connected to the Manchester Sheffield & Lincolnshire Railway (Later the Great Central Railway or GCR) upon opening it was later also connected to the Midland Railway via an extension of the Killamarsh Branch.
- 8.10.14 Unlike the other pits it never used the Chesterfield Canal for transport and had no colliery wharf. Following the refusal of the GCR to purchase the in-situ coal under the Norwood Tunnel, the Colliery Company continued to extract coal leading to the tunnels eventual collapse. Once the tunnel was abandoned the colliery company (and later the National Coal Board) undertook many operations to infill and stabilise the remaining portions of the tunnel under its land (see Structural Perspectives 2004). The colliery continued in production until 1992 and was finally closed in 1994. The ornate colliery offices (1866) and the modernist pit head baths (1932) both survive but the rest of the site has been landscaped – the southern colliery tip now providing a striking viewpoint over the rolling landscape below.

#### **Other Industries: Brick Works**

- 8.10.15 Huge local demand from industrial growth, clay from Coal Measures seat earths and coal to fire the kilns provided the impetus for the massive expansion of brick making in this area during the 18<sup>th</sup> and 19<sup>th</sup> centuries. An early driver was the demand for brick during the construction of the Norwood Tunnel when several hundred-thousand bricks were produced in up to fifteen kilns along the tunnel line (see below). The tunnel kiln sites were short-lived and did not continue in use after it's completion. Other sites had longer lives and there are several small brick works recorded in the canal corridor. Typical sites include:

#### Barbers' Lane Brick Works

- 8.10.16 Located on the edge of the Rother floodplain. Recorded in 1854 and shown on the 1870 large scale OS map, by 1899 the site of the kilns has been replaced by a row of cottages known as Barber's Row. These cottages have also now been demolished and the entire site landscaped. There is no surface evidence for brick making.

### Norwood Colliery Brickworks

- 8.10.17 Located on the south bank of the Canal opposite Norwood Colliery. Although there is little indication of a wharf wall, the bank adjacent to the Yard is obscured by modern debris and it is likely that some of the production was exported by canal. The site was in use from the 1870's to the 1920's. It was cleared by 1948 and the site used for Norwood Trading Estate in the 1980's. Again, there is no surface evidence for brick making.

### Killamarsh Village Brick Pits

- 8.10.18 Located adjacent to the Chesterfield Canal in the area now occupied by the Killamarsh Sports Centre. A similar brick pit was located on Sheffield Road. All open in the 1850's or 60's and appear on the 1870 Ordnance Survey maps and all are out of use by the early years of the 20<sup>th</sup> century.

### **Other Industries: Chemical Works**

- 8.10.19 The woodlands of the area provided the basis of a substantial wood charcoal business in the Post-Mediaeval period with the majority of production going to ironworking. Some charcoal, however, was destined for other chemical uses (filtration, dyes, pigments, etc) and may be thought of as the origins of the areas chemical industry. In the late 18<sup>th</sup> and early 19<sup>th</sup> century abundant coal provided the raw material and fuel for the growth of the industry with an emphasis initially on the production of coal-tar and tar distillates.
- 8.10.20 Two dedicated chemical plants occur in the study area; the first is the "Derbyshire Chemical Works" located to the west of Norwood Colliery. This plant was a relative late comer not being established until around 1898. It produced tar products and extracts and continued in production until the 1940's. The site was served by private sidings off the Killamarsh Branch railway and these offered the last traffic carried on this line. The site continues to be used for chemical processing and recovery (toxic waste handling). Some brick built buildings relating to earlier phases of use survive but the secure nature of site precludes survey.
- 8.10.21 The second site lies to the east near the foot of the Norwood Flight and the County Dike. The "Norwood Chemical Works" site appears to have been in use from about the time of the opening of Norwood Colliery in 1866. It was owned by the same company (Sheepbridge Coal & Iron Company) and under the same manager as the pit. The layout, retorts and water tanks are indicative of an acid works. A short length of wash wall, unusual on the off bank away from a bridge hole, suggests that the works had its own wharf and used water transport. By the time of the Fowler Survey in 1892, however, there is no indication of a wharf at this point.
- 8.10.22 The Norwood site is on a very small scale and in common with the small plants attached to the collieries would have found it difficult to compete with the economies of scale achieved at centralised chemical works such as those developed in the early 20<sup>th</sup> century (e.g. the former National Benzole / Coalite plant at Bolsover and the chemical plant integrated with the Staveley Iron and Steel works at Staveley). The Norwood Chemical Works are shown on the OS maps as disused by 1924 and the site appears to have been cleared between the wars. In the 1990's the site was

land-filled and an inert surface layer placed over the entire area burying all trace of the works.

- 8.10.23 It should also be noted that both Norwood and West Kiveton Collieries also had coke ovens, gasworks and tar extractors. This continued only while small scale production of coal by-products remained viable and was superseded by larger centralised plants in the early 20th century.

### **Tramways**

- 8.10.24 Tramways linking collieries and iron mines with the canal were an early development. The first recorded railway (described as a “Newcastle Rail Road”) in Derbyshire was built by the Chesterfield Canal Company in 1778 between the terminus of the Norbriggs Cutting branch canal and a nearby colliery (Lewis 1970). The Norbriggs “rail road” was, from the description in the Company minute books, a timber edge railway similar to the waggonways built around Newcastle. At some point this route was extended and re-laid with L shaped iron tramway plates.
- 8.10.25 This set a pattern for other tramway feeders to follow and by the early 1800’s there were a number of feeder tramways bringing coal and other products to the canal including the long lines from Collieries at Eckington to a canal wharf at Boiley Farm (The Setcup Tramway) and from Comber Iron Mines to the Renishaw Iron Works Wharf (the Spinkhill Railway). All of these lines were tramways (the flange being on the plate or rail – the wheel being plain and not flanged). The gauges are unknown but Riden (1978) suggests, based on field work, that most were around 3ft between plates.
- 8.10.26 These tramways prospered according to the fortunes of their parent collieries or industries. Some were very short lived and some of the confusion over the mapping of these feeders stems from the fact that they were often fairly ephemeral and were changed quickly to accommodate the changing pattern of mineral extraction and industry.
- 8.10.27 In the study area we have evidence for a tramway from the end of the Church Arm of the Chesterfield Canal at Killamarsh to local coal pits in the Dale Valley. Several routes are shown on different maps but all commence at the Church Arm Wharf, cross Church Lane and then run parallel to it up the Dale Valley. It reached the coal pits at “The Dale” and then the lines diverge and are shown running to different coal pits in the area. Archaeological evidence is slight but there are faint traces of earthwork formations in the lower Dale valley on the west side of Dale Road. The upper part of the valley has been extensively reclaimed and the location of many of the pits served by the tramway are now impossible to trace on the ground.
- 8.10.28 The opening of the Killamarsh tramway is unknown but the side cut from the canal to Church Lane opened in 1776 and was built at the behest of a local landowner with coal interests. The cut was originally intended to extend beyond Church Lane as a bridge was planned. As built, the cut stopped immediately to the north of the lane and it is tempting to see the tramway as a convenient way of linking pits to the canal and also avoiding the cost of the bridge. If so, this makes this a further early wooden railway predating by two years the line at Norbriggs.

- 8.10.29 From early descriptions of the line we can be certain that the line was in operation by 1817 and by that date it was a conventional iron plate tramroad. The line is shown on the first edition 1" OS survey published in 1834 (but surveyed some years earlier) and other maps of similar age and it appears likely that it was still operating up to the 1840's. The tramway from pit to canal wharf had gone by the time of the first detailed OS map survey in the late 1860's and early 1870's, although one route is replaced by a very straight (and thus probably cable hauled) colliery tramway linking pits at the Dale with High Moor Colliery on the hill above.
- 8.10.30 The Killamarsh Tramway follows the pattern of other tramways which were gradually superseded by edge railways and improved roads. All the canal feeder tramways had gone by the 1870's with the exception of the Dixons Wharf Tramway which linked Dixon's Works to the Canal at Whittington.
- 8.10.31 The tramways in the study area were horse drawn with the exception of the much later High Moor Colliery tramway which was cable hauled. Steam traction was not used on these lines as they were all short and loads small. Only where lines were longer and loads greater did it make sense to use the innovative, and expensive steam engine. In North East Derbyshire only on the Sheepbridge Railway – a long narrow gauge edge-rail tramway linking the Sheepbridge Ironworks to the Chesterfield Canal near Tapton Lock and later to the Midland Railway – are there contemporary accounts of the use of a locomotive. In December 1863 during a tour to determine the potential for steam traction on the Forest of Dean Tramroads, Mr Keeling, the company's engineer, witnessed a 3ft gauge 040 steam locomotive at work at Sheepbridge where is served three collieries, two ironstone mines and four blast furnaces. It appears to have been the only engine at work (Forester 1963).
- 8.10.32 Few of the tramways developed into standard gauge edge railways on the same alignment. The exceptions were (1) parts of the Dixons Tramways converted to the standard gauge "Glasshouse Common lines" by the Midland Railway and (2) the Sheepbridge Railway, again converted to standard gauge by the Midland Railway. Both conversions took place in the 1870's.

## **Railways**

- 8.10.33 The railway history of this area is complex but is well documented by Proctor (1975), Joy (1984) and Leleux (1984). The canal corridor was affected by the activities and lines of three railway companies:

### The North Midland Railway

- 8.10.34 The age of long distance "edge rail" railways (the rail is plain and the flange is on the wheel) was ushered in with the construction of the North Midland Railway through the area in the late 1830's. The North Midland ran from Derby to Leeds and was surveyed and designed by George Stephenson. From Chesterfield to Rotherham the line followed a gently graded route along the Rother Valley with substantial earthworks and bridges over the Rother. It opened from Derby to Masborough (Rotherham) on 11<sup>th</sup> May 1840 and through to Leeds seven weeks later.
- 8.10.35 In 1844 the North Midland Railway joined with the Midland Counties Railway and the Birmingham & Derby Junction Railway to form the Midland Railway. The Midland Railway became one of the most important railways of the 19<sup>th</sup> and early 20<sup>th</sup>

centuries and eventually extended from London (St Pancras) to Carlisle. In 1922 the Government introduced an act to merge the 123 independent railway companies of the UK into four large groups. Following the grouping on 1<sup>st</sup> January 1923 the Midland Railway became part of the London, Midland & Scottish Railway.

- 8.10.36 The first Killamarsh station lay to the west of the village and opened on the 11<sup>th</sup> May 1840. It was short lived and closed on the 2<sup>nd</sup> January 1843, when it was replaced by a new and more substantial stone structure. With the arrival of the Manchester Sheffield & Lincolnshire Railway's Derbyshire Lines in the 1890's the station was renamed Killamarsh West to distinguish it from Killamarsh Central. Killamarsh West passenger station closed on the 1<sup>st</sup> February 1954 although the line remains open for goods and as a diversionary route for passenger services.

#### The Manchester Sheffield & Lincolnshire Railway

- 8.10.37 The west-east route from Sheffield to Worksop, Retford, Gainsborough and Lincoln runs to the north of the canal corridor and then runs parallel to the canal from Kiveton Park to Shireoaks. The line was proposed and constructed by the Sheffield and Lincoln Junction Railway who obtained an Act on 3rd August 1846. It was completed and opened on 12th February 1849. Shortly after, on the 27th July 1849, the S&LJR amalgamated with several proposed and actual railway companies (and the Chesterfield Canal Company, see below) to form the Manchester, Sheffield & Lincolnshire Railway.
- 8.10.38 When opened in 1849 the line had one local station at Kiveton Park, further stations were opened at Waleswood on the 1<sup>st</sup> July 1907 and Kiveton Bridge on the 8<sup>th</sup> July 1929. The Sheffield–Lincoln line remains open but the Station at Waleswood closed on the 7<sup>th</sup> March 1955.
- 8.10.39 During the 1880's the MS&LR began to expand southwards with the eventual goal of creating its own route to London. The first stages in this bold plan were the "Derbyshire Lines" which ran from Beighton Junction to Staveley (Central) down the Rother Valley parallel to the Midland Railway route and opened on 1<sup>st</sup> June 1892. On the same date the MS&LR opened Killamarsh Central Station.
- 8.10.40 In 1893 the MS&LR opened the Waleswood Curve which crossed the Rother valley from Beighton to Waleswood and gave north-bound trains access to the line to Worksop and Gainsborough. The line crossed what is now Rother Valley Country Park and practically all trace of this line (including Bedgreave viaduct) has been removed in the opencasting and reclamation of this site.
- 8.10.41 In anticipation of the London extension the MS&LR changed its name in 1898 to the Great Central Railway and the line to the capital was opened throughout in March 1899.
- 8.10.42 In the grouping of 1923 the GCR became part of the London & North Eastern Railway. Following the creation of British Railways in 1948 it became even more obvious that the GCR London extension duplicated earlier routes. In consequence it was an early victim of the rationalisation which followed the Beeching Report. Killamarsh Central lost its local passenger service on 4<sup>th</sup> March 1963. The rest of the London extension followed and long distance passenger services ended on the

5<sup>th</sup> September 1966. The line through Killamarsh Central continued in use for goods traffic for several years and the track was only finally lifted in 1983.

#### The Lancashire, Derbyshire & East Coast Railway

- 8.10.43 The last company to cross the canal corridor in this section was the grandly titled Lancashire Derbyshire and East Coast Railway which had plans to link Warrington in the west with a new port at Sutton on the Lincolnshire coast in the east via Chesterfield and Lincoln. The line had powerful backers in the form of the Arkwright family but was never completed as planned. The final route ran from Chesterfield to a junction with the MS&LR in a ploughed field near Lincoln with a branch north from Langwith Junction through Clowne to Spinkhill and Killamarsh to Sheffield. It never reached Lancashire or the East Cost. The “main line” and the Clowne branch opened on the 8<sup>th</sup> March 1897. The extension of the Clowne Branch to Sheffield opened on the 30<sup>th</sup> May 1900 and with it the stations at Spinkhill and Upperthorpe & Killamarsh (Cupit & Taylor, 1966)
- 8.10.44 The company never achieved its potential and rapidly became prey to the attentions of surrounding larger concerns. In 1905 it was agreed that the LD&ECR would be absorbed by the Great Central Railway as of 1<sup>st</sup> January 1907.
- 8.10.45 The Sheffield - Langwith line through Killamarsh never carried heavy passenger traffic and Upperthorpe & Killamarsh Station was closed on the 7<sup>th</sup> July 1930. Spinkhill followed when all passenger services were withdrawn on the outbreak of the Second World War. Goods traffic lingered on and the line was closed in stages during the 1960's. The last active section was that from Beighton to Upperthorpe which remained open to serve the colliery at Westhorpe until that closed in 1984. The track was lifted shortly after.
- 8.10.46 A summary of the stations and their opening and closing dates where known is given in Appendix B, Table B3.

#### Railways within the Canal Corridor

- 8.10.47 Within the study area, a significant number of recorded features relate to the standard gauge Killamarsh Branch of the Midland Railway which ran parallel to the canal corridor. The branch commenced at Beighton and when opened around 1866 ran across the floor of the Rother valley to reach Norwood Colliery. The line was then extended to reach first, West Kiveton Colliery (1874) and then Kiveton Park Colliery (by 1883). Today the route is becoming increasingly difficult to trace. Most the western half of the line was removed by open cast coal extraction in the Rother Valley, while the earthworks on the climb up to Norwood End Tunnel have been removed in the last five years. Norwood End Tunnel itself runs under the M1 motorway and has been largely infilled. The cutting to the west of the Tunnel has been infilled (landfill). The cutting to the east of the railway tunnel remains but the route into the Kiveton Park Colliery site has been obliterated by the reclamation of the site.
- 8.10.48 The Killamarsh branch was for goods traffic only and essentially only ever carried coal. It was steeply graded and required special operating regulations including the banking of trains and protection of the main line for descending trains. Although the line was not rated for passenger traffic, there is a local legend that during the

Second World War the visiting Royal Train was stabled, for security during air raids, in Norwood End Tunnel.

### **Industrial Settlement: Housing**

- 8.10.49 Standing industrial housing, commercial structures and non-conformist religious buildings have not been recorded in this survey unless they are immediately adjacent to the canal track or are tied to a canal related industry.
- 8.10.50 The only housing recorded in the survey is generally tied housing directly associated with a particular industry. Examples include the properties built by the Canal Company on the Norwood Flight and the housing built for the Derbyshire Chemical Works (Ellison's Cottages). Little of the tied housing provided by industrial concerns has survived and inferences have had to be drawn from maps, drawings and photographic evidence. The majority of earlier structures associated with the canal were in coal measures sandstones with steeply pitched pantile roofs; later structures tend to be in red brick with shallower pitch Welsh slate roofs. In general the building styles reflect the vernacular of the East Midlands rather than Yorkshire, in particular the use of brick jack arches over the window and door reveals rather than wooden or solid stone lintels.
- 8.10.51 The ongoing redevelopment of the villages and the abandonment and secular re-use of religious buildings poses an obvious threat to this element of the heritage resource. Comparison of photographic records shows the rate of loss of industrial, vernacular and non-conformist religious buildings is high. There is an urgent need to record what remains.

### **Farming**

- 8.10.52 Early in the Industrial Period the farming landscape underwent significant re-organisation through enclosure. The Rotherham townships of South Yorkshire were enclosed shortly after 1762 and this may have included Wales and Kiveton Park. In Derbyshire enclosure is a few years later; the Killamarsh Parliamentary Enclosure plan dates to 1779 (DRO Q/RI 59) although the evidence of field boundaries (see below) suggests that some enclosure of the original strip fields had already taken place by that date.
- 8.10.53 While across most of the route the canal's construction is either roughly coeval with or slightly predates enclosure there are locations where the canal cuts across earlier enclosure. At Killamarsh for example, the canal cuts across field boundaries which reflect fossilisation of strip cultivation patterns. Even as late as the 1890's land ownership of the severed strips either side of the canal is often in the same hands.
- 8.10.54 The construction of the canal from 1771 to 1777 was therefore taking place in a landscape which was itself undergoing rapid change. This can be seen from the field boundaries which largely respect the canal line and make full use of it as a boundary.
- 8.10.55 In consequence the majority of surviving boundaries and hedgerows have their origins at this time. There are, however, a few ancient boundaries of which we can be reasonably certain. The County Dike (a natural stream) appears to have formed a

long term boundary, while the hedge-bank around much of the Nor Wood (a documented ancient woodland) is almost certainly Mediaeval or earlier.

- 8.10.56 The largest area of demonstrably ancient woodland is the Nor Wood. Although this has been partially replanted it contains sufficient elements to show continuity from the woodlands described in the 1550's sale documentation (see above). Other patches of ancient woodland may exist but all the other woodland examined to date is secondary and plantation woodland often growing over early industrial works such as bell pits or footrills.
- 8.10.57 In the period following enclosure further consolidation led to the creation of larger farms. By the 1830's a number of improved "model farms" had been established. Along the Chesterfield Canal a number of these farms were situated canal side to make best use of this new transport system. The Penny Home Farm at Kiveton and the unnamed farm on the canal bank to the west of Norwood Colliery Wharf (both now demolished) may have similar improvement movement origins.

# Assessment of the Archaeology & Heritage of the Chesterfield Canal

## 8.11 Historical Background & Context

### Origins

- 8.11.1 The story of the origins, rise and eventual decline of the Chesterfield Canal is unique. Many of its features are distinctive and have given rise to distinctive attributes – even the boats used on the Canal were strikingly different from those used in other regions (cf. Paget-Tomlinson 1979, Richardson 2005).
- 8.11.2 The Chesterfield Canal runs west to east across the north-south grain of the country. This reflects the patterns of trade established in this area by the 1300's. At that time the fledgling lead and iron industries of North Derbyshire and South Yorkshire found their main outlets via pack horse to the inland port of Bawtry at the head of reliable navigation on the River Idle. From Bawtry cargoes were dispatched to Hull and onward to eastern England, London and the Low Countries. In return imported goods came in from throughout Europe and Scandinavia. By 1350 Bawtry was one of the principal ports for South Yorkshire & North East Derbyshire.
- 8.11.3 The River Idle navigation underwent improvement during the late 1600's but trade from South Yorkshire fell away with the improvements to the River Dun (Don) undertaken from the 1720's onwards. Trade from Chesterfield and North East Derbyshire began to be hampered by the poor state of the roads to Bawtry and high tolls on the Dun Navigation. In Chesterfield thoughts began to turn to replacing the road with a canal and by 1768 there was sufficient local interest to engage the services of a civil engineer, James Brindley.
- 8.11.4 By 1768 James Brindley had an enviable reputation as a canal engineer. Many schemes were clamouring for his services and as a result he sent one of his assistants, John Varley, to undertake the initial survey. In early 1769 Varley surveyed a route from Chesterfield to Shireoaks that was almost identical to the route eventually constructed. At Shireoaks, following his brief to survey a "water way to Bawtry", his proposed route turned north east across open country to reach the shallow valley of the Ryton which he then followed to the River Idle and Bawtry.
- 8.11.5 In December 1768 the notion of the canal began to circulate in Retford. Inspired by a visit to the Bridgwater Canal (designed by Brindley), the headmaster of Retford Grammar School, the Reverend Seth Ellis Stevenson, began a vigorous campaign to bring the canal to Retford. Approaches to the Chesterfield promoters brought a positive response and by June 1769 Varley was again in the field this time searching out a route via Worksop and Retford to West Stockwith.
- 8.11.6 In August when the first public meeting was held in Worksop to promote the canal Brindley supported the Retford route. At that same meeting parties from Gainsborough made strong representations that the canal should terminate on the Trent at Gainsborough not West Stockwith. There followed a brief but spirited campaign between the two camps which was settled by the intervention of the Reverend Stevenson. When, in January 1770, Brindley spoke to another crowded

meeting at the Crown in Retford he was able to announce that the route would be Chesterfield -- Worksop -- Retford -- West Stockwith.

- 8.11.7 The “Act for making a navigable cut, or canal, from Chesterfield, in the County of Derby, through or near Worksop and Retford, to join the River Trent at or near Stockwith in the County of Nottingham” was to finally receive the Royal Assent on Thursday 28<sup>th</sup> March 1771. The news reached Retford and Chesterfield on the 30<sup>th</sup> March and was greeted with great rejoicing.

### **Building the Canal**

- 8.11.8 The Chesterfield Canal was the last waterway to be engineered by James Brindley the “father of English canals”. Brindley died in 1772 and the work was brought to fruition by John Varley and Hugh Henshall. It is a moot point if some of the innovations seen on the canal were designed by Brindley or were the work of his assistants. Whatever their origins, the civil engineering innovations on this canal warrant greater recognition.
- 8.11.9 Construction started in the summer of 1771 at the summit pound of the canal at Norwood. At first sight the Chesterfield Canal appears to be a typical early meandering contour canal. It also displays, however, civil engineering features which presage the later, straighter, cut and fill canals. These include the overall boldness of the route, the first extensive use of locks in multiple flights and the use of embankments and cuttings to shorten the line. In consequence the physical remains of the canal include several pioneering civil engineering features and unique survivals of late 18th century canal construction. Many of these structures are listed ancient monuments.
- 8.11.10 The canal opened throughout in 1777 although much of it may have been in use from 1775. The origins and history of the canal is summarised in Hadfield (1970) and explored in detail in Richardson (1992).
- 8.11.11 The early minute books of the canal company have survived and provide an almost unique insight into the construction of the canal (Richardson 1996). They show the struggles of local shareholders to come to terms with this new technology and to overcome the inevitable crises which followed the death of James Brindley in 1772.

### **Opened for Business**

- 8.11.12 The Chesterfield Canal opened throughout in 1777 (although the majority of it was in use in 1776) and faced an early struggle caused by the economic recession which followed the loss of the American colonies the previous year. Nevertheless, within ten years the canal began to show a modest dividend and steady trade in all manner of goods was established including:

- Agricultural produce
- Malt
- Hops
- Sail Cloth
- Gravel
- Bricks and Tiles
- Coal and Coke
- Iron Ore
- Iron Bar and Cast Iron products
- Lead
- Lime
- Marble

- 8.11.13 The canal was built as a narrow canal from Chesterfield to Retford. At Retford the canal became wider and the locks from there to the Trent were built to broad beam (Trent Flat or Barge) dimensions. The intention was to have broad beam boats working to Retford but the presence of several pinch points and narrow bridge holes meant that this vision was not realised and broad or Trent boats were never to reach Retford.
- 8.11.14 From the outset the canal had several short branch canals or arms of which the Norbriggs Cutting at Mastin Moor was the longest at 1¼ miles. Shorter arms led to coal wharfs at Killamarsh (Church Lane) and Staveley (Bellhouse Lane, Lowgates), to limestone quarries at Cinderhill (near Shireoaks) and a stone quarry at the end of the Lady Lee Arm, near Worksop.
- 8.11.15 The canal was also fed by other minor canals which did not physically connect with it. At Hollingwood near Staveley, the “Hollingwood Common Tunnel Canal” operated a 1½ mile long underground canal from mines on Hollingwood Common to a transhipment wharf on the Chesterfield Canal. The boats operating in the tunnel were of “tub boats” of narrow width and short length, they brought the coal out in large iron bound wooden crates which were transhipped by crane (an early form of containerisation) onto the standard width narrowboats of the Chesterfield Canal. This type of mine canal was common in other areas (e.g. at Worsley Delph on the Bridgewater Canal) but rare in Derbyshire. Parts of the tunnel arch survive and were located in archaeological studies in the 1980’s.
- 8.11.16 Another short isolated Canal ran from the Adelphi Ironworks to the south of Staveley to a wharf on the Inkersall Road where it had a transhipment wharf. Carts then took the goods to the Chesterfield Canal where they were again transhipped. This canal has been entirely lost to opencast mining and reclamation works.
- 8.11.17 Much of the trade in Derbyshire reached the canal via an intricate network of feeder tramways, plateways and railways, including the earliest known “raile way” in Derbyshire. This was built at the behest of the Canal Company in 1789 and ran from Norbriggs Wharf to Norbriggs Colliery. These tramway feeders mostly brought coal to the canal although the tramway from Whittington, which terminated at Dixon’s Wharf, near Bilby Bridge, brought iron castings and glass to the canal as well. These tramways flourished from the 1790’s through to the 1830’s and 40’s when several appear on the first Ordnance Survey maps. Practically all had gone by the 1850’s but one, from Whittington to Dixons Wharf, continued in use until the 1870’s.

### **The Coming of the “Stephenson” Railways**

- 8.11.18 Once the early trade depression had concluded, the canal became a commercial success and was instrumental in the development of the iron, chemical and glass industries of North East Derbyshire. It settled down to a steady if not spectacular life with a steady stream of modest dividends.
- 8.11.19 Long distance railway competition arrived in the 1840 with the opening of the *North Midland Railway* (a constituent of the *Midland Railway* (MR)) from Derby through Chesterfield to Leeds. This was rapidly followed by a bill in the 1846 Parliamentary

session to construct a railway from Sheffield to Lincoln. The “Sheffield & Lincoln Junction Railway” was promoted by the Sheffield, Aston-under-Lyne and Manchester Railway as part of their plans for a through route from Manchester to Lincoln.

- 8.11.20 The proprietors and shareholders of the Chesterfield Canal were alarmed by the prospect of a railway running parallel to their route through Worksop and Retford and the prospects for loss of long distance and river trade. In response they quickly promoted their own scheme, the Manchester & Lincoln Union Railway. The Sheffield & Lincoln Junction Railway wisely entered into talks with the M&LUR which led to the establishment of a joint board of Directors. The price of M&LUR support was the inclusion of the Chesterfield Canal in the amalgamation. Incorporated on 7<sup>th</sup> August 1846 as the “Manchester & Lincoln Union Railway & Chesterfield & Gainsborough Canal Company”, the whole awkwardly named undertaking was vested in the new “Manchester, Sheffield & Lincolnshire Railway” on 9<sup>th</sup> July 1847.
- 8.11.21 In addition to the main Sheffield-Lincoln line, the M&LUR&C&GCC did gain powers to build a new line from Worksop to Staveley but this was never constructed. The final link in the main line of the new *Manchester, Sheffield & Lincolnshire Railway* was completed with the opening of the line from Woodhouse to Gainsborough on the 17<sup>th</sup> July 1849. The station alongside the canal at Kiveton Park opened the same day.
- 8.11.22 Initially this stimulated additional activity on the canal. With the failure of the Worksop to Staveley branch proposals, the railway company instead treated the canal as a branch line and constructed an interchange wharf to the east of Kiveton Park Station. Attempts were made to compete with the Midland Railway on through tariffs to Chesterfield and Staveley. Certainly the canal receipts for the period from c.1840 to around 1860 remain relatively buoyant, but by the late 1860’s revenues had begun to seriously decline and it was clear that the canal was unable to compete with the speed of the railways. By the 1880’s the MS&LR had begun to think of expansion southwards and the creation of what became its “Derbyshire Lines”. The Ironmasters of Staveley were strong supporters of the MS&LR southward expansion, hoping it would break the Midland Railway’s near monopoly and reduce freight tariffs. Once the Derbyshire lines were completed, the majority of canal side customers were connected to the railway system or had a very local station and as a result trade on the canal fell away quite dramatically.
- 8.11.23 The construction of the MS&LR’s “Derbyshire Lines” in the late 1880’s had marked consequences for the Chesterfield Canal; the planned railway route south followed a straight course and was to cross and re-cross the original line of the canal. Initially the MS&LR attempted to close the canal but the Act of Parliament for the Derbyshire Lines had a clause inserted which prohibited closure. To avoid the cost of numerous bridges a number of diversions were carried out. These were:-
- Killamarsh to Renishaw (the Long Straight); the original canal line to the west of the new railway was abandoned but can still be traced today.
  - Renishaw to Hague Lane; here the cut-off sections were largely removed or buried by the construction of the Goods Yard at Renishaw Central Station.
  - Hounsfild Bridge to Staveley Works; the isolated section was again west of the new railway and ran around the margins of the Stanton and Staveley

Works. Any trace of the Brindley route has been destroyed through a combination of works redevelopment, opencast coal extraction and land reclamation.

- Chesterfield Wharf; the first canal Wharf was cut off from the canal by the Railway and a new wharf was constructed upstream on the edge of the new railway goods yard. This became known as the “Railway” or “Great Central Wharf”.

8.11.24 All of these new sections were constructed quickly and probably came into use several months prior to the official opening of the railway from Beighton Junction to Staveley Central and thence to Chesterfield in June 1892. Eventually this railway was to become part of a new route to London and in recognition of enhanced status on the 1st August 1897 the MS&LR changed its name to the Great Central Railway.

### **Decline, a Fall and Revival**

8.11.25 The arrival of a parallel railway route accelerated the inevitable decline in trade. By the early 1900's most manufactured goods and sundries trade had been lost and the cargoes which remained were low-value and high-bulk; coal, coke, stone, bricks, aggregates, timber and grain.

8.11.26 The western end of the canal was isolated by the partial collapse of the Norwood Tunnel in October 1907 and all trade west of Norwood ceased around 1914-18. For some time after the war the canal remained in water to supply various industries but in many places became overgrown and neglected. Some sections began to acquire other uses – for example, in Killamarsh for many years rowing boats were hired out on the length of canal near Bridge Street. By the 1950's the canal was no longer required for water supply and from the late 1960's through the 1970's sections were sold off and gradually infilled.

8.11.27 To the east of the tunnel the decline was more gradual and regular cargoes continued from Shireoaks Colliery, Worksop and Gringley to the Trent until the early 1950's with the last sporadic commercial carrying being in 1956. Fortunately this coincided with the rise of the preservation movement and attempts to downgrade the entire canal to remainder status or to close it entirely were defeated. In 1976 the Chesterfield Canal Society was formed to promote the use of the canal and its eventual restoration.

### **The Canal Industries and their Communities**

8.11.28 The arrival of the Chesterfield Canal helped to shape the landscape and communities through which it passed.

8.11.29 This effect is most marked in Rotherham and North East Derbyshire where towns and villages expanded dramatically or where entire new communities came into existence as industries sprang up alongside the canal. The pattern of settlement it helped shape was built upon by the railways and to a great extent persists today.

8.11.30 The origins of the canal are closely tied to the Derbyshire lead industry and the iron foundries at Staveley and Renishaw. The presence of the canal encouraged the growth of these ancient industries and led to the expansion of the Derbyshire coal industry; feeder tramways from pit to canal include the first record of Newcastle style

“raile way” in Derbyshire. A similar tramway led to the glassworks at Whittington. The arrival of the canal and the relatively breakage free transport which it offered resulted in the expansion of the glass industry and its associated chemical industries.

- 8.11.31 To some extent the canal in North East Derbyshire entered an already partially industrialised landscape and, through providing cheap transport, permitted the rapid growth of ancient industries and the appearance of many new industries. As a result the canal served practically all the key heavy primary manufacturing industries of the industrial revolution.
- 8.11.32 In contrast the eastern reaches of the canal initially traversed an almost entirely rural landscape. The arrival of the canal occurred at a time of major reorganisation of the landscape and many of the new model farms constructed by the larger estates at this time had their own wharfs and used the canal to export their produce.
- 8.11.33 Throughout the Nottinghamshire length the canal again permitted local craft activities to expand and industrialise where raw materials existed. For example the growth of the brick and tile manufactories at Misterton and Gringley can be tied to both the ease of export of the finished product and to the ease of importing Derbyshire coal as fuel. One unique trade brought cargoes of Trent silt or warp to brickworks like those at Walkeringham for drying and grading to produce polishing powders used in the Sheffield cutlery finishing trade. Some of these industries were ephemeral and have left scant record bar a few entries in a boat book; others proved long lived – the last cargo from Walkeringham Brick Works was carried in 1954 – and have left a rich archaeological legacy.
- 8.11.34 The canal therefore runs through two regions with very different histories and in consequence landscapes.
- 8.11.35 The waterway was also used for more than transport. Water power was a vital element in the rural economy until the twentieth century and, especially on rivers, conflicts between mill and navigation interests were common. In such a low lying district the waterways also played a key role in land drainage. Conversely, waterways were often key water suppliers with water being abstracted for industrial purposes as varied as brewing, irrigation, chemical works and brick making. All these activities have left a further archaeological legacy along the water corridor.

## 8.12 Archaeology of the Chesterfield Canal

- 8.12.1 In this survey, unsurprisingly, the history and development of the canal is well represented; the vast majority of archaeological features located relate to the Norwood Flight, the Norwood Tunnel, the water supply to the summit pound and to the Church Arm Side Cut.

### Norwood Flight

- 8.12.2 The Norwood flight is the most significant surviving group of structures. It is one of the very earliest multiple lock flights and one of the few which was not extensively reconstructed in the later canal period. The primary interest, however, comes from the use of the flight as the principle construction yard for the building of the Norwood

Tunnel and much of the canal in Derbyshire. The site has the potential to reveal much about how the early waterways were constructed and the methods used.

- 8.12.3 The Locks themselves show clear evidence of patching and running repairs and although some have been entirely infilled, those that are visible retain many original elements. The Norwood locks appear directly comparable with the Turnerwood and Thorpe Salvin flights which were built at the same time. These latter locks were archeologically investigated by a British Waterways archaeological team during their restoration. This revealed a number of interesting features some of which appear unique to the Chesterfield (Coxah & Gardner 2004). Of particular interest was the discovery of wooden “ground anchors” very similar in construction to the “cross tree and one quarter bar” struts used in mill construction (see for comparison Watts 2002, plate 47). It would be interesting to see if this construction method was also used at Norwood – if it was it would imply that the locks were built to a detailed plan rather than being left to the builder on the site.
- 8.12.4 The side ponds, weirs and main by-washes also remain largely intact, although many of the lock and intermediate by-washes are infilled and built over. The lower pond has been reduced in area by infilling of its western end but the majority of the ponds remain substantially intact and were last dredged for fishing and ornamental purposes in the 1990’s.
- 8.12.5 The greatest losses involve the ancillary buildings and structures. The single storey tunnel keeper’s cottage adjacent to the west portal of Norwood Tunnel was demolished before 1960, as were the adjoining stables.
- 8.12.6 The saw mill and woodworking workshops were at the heart of the site. They were part of the original work camp on the site and provided the lock gates for the western (Derbyshire) section of the canal. Powered by a saw mill they are a very early example of the integrated use of the canal for navigation and power supply more commonly associated with later canals such as the Montgomeryshire (see for example, Hughes 1989, p.37, on the “water economy”). Integral to the workshop complex was a drydock for the repair and construction of wooden narrowboats. The feed water for the waterwheel was drawn from the drawn down leat of the drydock. A similar arrangement was employed at Retford where the drawn down water powered a mill (Roffey 1989).
- 8.12.7 Late in the career of the Norwood Saw Mill it appears to have been converted to steam operation with the erection of a new wood and corrugated iron power house. This may have been associated with the building of the MS&LR Derbyshire lines around 1890 – the canal was diverted several times during the construction and the yard could have supplied material for both the diversions and the new railway. Certainly the style of the new wood and corrugated iron structures is similar to that employed on construction sites along both the Derbyshire Lines and subsequent London Extension (cf. Rolt 1971).
- 8.12.8 With the completion of the Railway works and the closure of the Norwood Tunnel in 1907, the Norwood Saw Mill dwindled away. The closure date is uncertain but it probably occurred during the First World War. Subsequent uses of the site were varied. The waterwheel and saw mill were demolished between the wars. Remarkably, the main stone workshop building is still standing but has been extensively modified for domestic use.

- 8.12.9 The lock overseer's house and toll office survived until 1977 but has now been demolished. The red brick structure which survived until 1977 was possibly a later replacement for an earlier stone built cottage similar to that at the tunnel entrance or below at the Boatman Inn. The minute books show that the first Lock Overseer, Mr Samuel Knock, was appointed November 1775 on a wage of 15 shillings a week. The inference being that his residence was available for occupancy at that time. The style of the building in the photographs suggests, however, a construction date around the 1830's and it is possible that the original lock overseers cottage was rebuilt at around the same time as the Norwood Bridge (1836).
- 8.12.10 The outbuildings (probably a pigsty) and orchard associated with the overseer's cottage have also been lost.
- 8.12.11 At the bottom of the flight stood a further row of rough stone two-storey cottages with brick arch details. These were built as accommodation for workers on the Norwood site. Once the canal was completed part of the range was occupied by a public house known as the Dog and Duck in the 1840's and between 1864 and closure in 1909 as the Boatman's Arms. The building survived as a private residence until it was severely damaged by fire in the 1980's. It has subsequently been rebuilt in an not entirely sympathetic manner.

#### The Flight in Context

- 8.12.12 The Norwood Flight was a significant engineering feat and contained a striking concentration of three and four-rise locks. It was not, however, the first to use multiple chamber locks (where the top gates of one lock form the bottom gates of the lock above). The first two-rise canal lock in the UK was probably the Old Double Lock on the Sankey Brook Navigation which was brought into use in November 1757 (Hadfield & Biddle 1970). The first three-rise was at Bratch on the Staffordshire & Worcestershire Canal in November 1770, although these were later re-worked into conventional locks separated by very short (2 to 3ft) pounds (Hadfield 1969, Langford 1974). The first staircase of five locks was the "Bingley Five Rise" on the Leeds and Liverpool Canal which opened in March 1774 (Hadfield & Biddle 1970) approximately eight months before the double and treble locks between Norwood and Retford came into use in November 1774.
- 8.12.13 With the exception of the Sankey Brook, James Brindley was engineer to all these schemes either in design or construction. In many cases Brindley's involvement in the finer points of the design is uncertain. In the case of the Norwood Flight it was surveyed and planned under his direct supervision in 1769, but was completed by John Varley during his tenure as engineer between his appointment in 1772 (following Brindley's death) and his replacement by Hugh Henshall in 1774.
- 8.12.14 While the Chesterfield Canal may not have been the first use of multiple locks as some have claimed, the Norwood Locks nevertheless "...represent a considerable achievement, and were undoubtedly the most emphatic use of locks on any canal to that date" (Robertson 1998). What is of significance is the sheer concentration of locks both east and west of the Norwood Tunnel and the forward looking boldness of the route set out by Brindley.

#### **Norwood Tunnel**

- 8.12.15 The second most significant group of canal structures relate to the Norwood Tunnel. At 2880 yards\* (c. 1½ miles) it was briefly the longest canal tunnel in the UK but was eclipsed by Harecastle (2880 yards) and latter by the deeper Pennine tunnels. Nonetheless at the time the Norwood Tunnel was a remarkable achievement.

*(\* there is some argument over the length of the Norwood Tunnel. Most records give a length of 2850 yards, however records examined by Christine Richardson (pers comm.) clearly show the original length to have been 2880 yards – since the tunnel has never been shortened it must still be that length today).*

#### History

- 8.12.16 The Norwood Tunnel was designed by James Brindley. It was, in many respects, the “twin” of Harecastle Tunnel in Staffordshire (Richardson 2002), also designed by Brindley and of a similar length and with an equally stark functional design.
- 8.12.17 The initial plans suggest that Brindley originally intended to carry the canal over most of the Coal Measures ridge on the surface with a short summit tunnel of around 630 yards. This would also have given a shorter summit pound of circa 2½ miles.
- 8.12.18 By the time work actually commenced in 1771 the route had been revised, the planned summit pound had been lowered and extended to 4 miles and the tunnel consequently lengthened to 2880 yards. It seems possible that the longer tunnel was foisted on Brindley partly by the wishes of the local landowner, the Duke of Leeds, and partly by a reconsideration of the water supply needs of the summit pound. Whatever the driving factor the Norwood Tunnel, while very long, is one of the shallowest canal tunnels with the great majority being less than 10 metres (c.30ft) from former water level to the ground surface.
- 8.12.19 Construction began with the laying out of a surface transect across the hill. From each end horizontal headings were commenced. Along the transect line a series of vertical shafts were excavated to the planned depth of the tunnel. Headings were then driven from the base of each shaft to the east and west to intersect with the headings from adjacent shafts and from the entrances to eventually form the main bore of the tunnel.
- 8.12.20 The well preserved remains of construction shaft mounds and the earth rings which mark the site of horse gins (horse driven winding wheels for raising spoil and lowering material) can be seen above the eastern end of the tunnel between Hard Lane and the Eastern Portal. These types of feature would have been present along the entire tunnel and many are marked the 1870 OS map series. Over time they have been removed, or have been buried by later colliery waste tips. In many cases the shaft locations are hard to locate on the ground but do show as crop marks on air photographs.
- 8.12.21 The construction shafts were used to raise spoil and lower materials to the tunnel works. A visitor to the canal in 1774 was told these shafts were to be bricked up and infilled. Many do appear to have been bricked up and infilled but at least one was left open. This was a large shaft near the centre of the tunnel. When woodland was planted adjacent to it this became known as “Open Shaft Plantation” and was marked as such on the 1870 edition Ordnance Survey maps.

- 8.12.22 The tunnel was brick lined throughout from the outset – by 1772 up to fifteen kilns were in operation near to the construction shafts but this was later reduced by eleven, leaving only four in operation throughout. According to Richardson (2009) around three million bricks were produced and used. It has proved difficult to locate these kilns from surface remains. Magnetometer survey may be one way to locate them.
- 8.12.23 The completed tunnel was a single bore of remarkably narrow diameter (it was not unknown for boats to “stick” on their way through). Boats were “walked” or “legged” through the tunnel by the crews lying on horizontal boards known as legging planks.
- 8.12.24 The absence of passing places within the tunnel led to it becoming a bottleneck and for a long time boats moved east and west through the tunnel on alternate days.
- 8.12.25 James Brindley died in 1772 and the tunnel was brought to completion by John Varley and Hugh Henshall in 1775.
- 8.12.26 The tunnel was finished in 1775 some 3 years and six months after commencement. The first boats passed through on the 7<sup>th</sup> May and the formal opening took place two days later when 300 people in three boats, led by Hugh Henshall and accompanied by a band were legged through the tunnel from western to eastern portal in little over an hour.
- 8.12.27 The first sign of problems came in September 1777 when a nineteen yard section of roof was damaged due to the removal of coal in the overlying ground leading to the unloading and weakening of the tunnel arch (it effectively “burst” upward as lateral pressures exceeded downwards compression forces on the arch).
- 8.12.28 Coal mining related problems continued and from the 1860’s onwards the development of deep collieries at West Kiveton and Kiveton led to progressive undermining the tunnel and its subsidence relative to the rest of the summit pound. As a result the roof of the tunnel sank and it became progressively more difficult to navigate.
- 8.12.29 Over a twenty year period from 1871 onwards the MS&LR undertook the slow process of raising the roof of the tunnel and creating a new tunnel arch. The process was interrupted in 1875 when a major collapse took place in the area immediately south of Wales around “Open Shaft Plantation”. This was subsequently opened out into a short cutting with two new tunnel portals being formed at each end of the breach. The opportunity was taken to widen the canal channel at the breach and it appears possible for two boats to pass. The open length appears to have been used to lower construction materials to the tunnel re-lining works – a wharf and a small building appears to have been constructed in the cutting and are shown on the OS 1891 edition. Both probably relate to these works.
- 8.12.30 The site of “The Tunnel Top Hole” is now infilled and lies under the former Kiveton Colliery Tip which now has been landscaped as part of the Kiveton Community Woodlands.
- 8.12.31 Problems with subsidence continued and when the Manchester, Sheffield & Lincolnshire Railway (later renamed the Great Central Railway) (the owners of the canal after 1842) refused the option of purchasing the coal under and above the Tunnel from the Kiveton Park Coal Company, its fate was effectively sealed. On

18th October 1907 at around 10pm the inevitable happened when after heavy rain a 12-14 yard section of tunnel immediately east of Hard Lane collapsed.

- 8.12.32 By this time there was little through traffic on the canal and following inspection and further legal wrangles with the colliery company the Great Central Railway declined to attempt further repairs. The tunnel was officially closed in 1908 thus isolating the western section of the canal.

Standing Remains: West Portal, Tunnel Keepers Cottage & Surround

- 8.12.33 The **western portal** takes the form of a simple arched opening in a vertical stone wing wall. The wall is composed of coal measure sandstone blocks laid in roughly half-overlapped mortared courses. The block heights are consistent at around 0.25 to 0.3 m and the resulting horizontal courses appear straight regular; the block lengths are less regular and vary from 0.45 to 0.25 m, leading to an irregular vertical overlap with the blocks below. The wall is completely plain and lacks any form of ornamentation or decoration.
- 8.12.34 The **tunnel arch** consists of three rings of hard red brick sitting on a footing of sandstone blocks keyed into the wall courses. Five courses of keyed sandstone blocks are visible above water level before commencement of the brick arch which extends through eight stone courses and is capped by a single course of stone.
- 8.12.35 It is uncertain if this interesting composite arch is original or results from the partial replacement of an original stone arch during the raising of the tunnel roof in the 1870's (above). It is noticeable that the projected centre and radius of the partial arch formed by the keyed stone blocks is different from the arch centre and radius of the brick arch leading to the portal having a slightly elliptical appearance. This may support the notion that the current arrangement is not original and results from the reconstruction.
- 8.12.36 The tunnel was still open when photographed in 1959. Since then the tunnel arch has been infilled with a soft red brick wall with a single rectangular opening in the upper-middle. This opening is closed with a series of vertical bars. Through the bars it is possible to see that the tunnel roof has collapsed into the passage space within approximately 5 to 10 metres of the opening.
- 8.12.37 The tunnel level summit pound is still in water and this runs up to foot of the blocking wall. The portal as a whole, while overgrown, appears in good condition with no obvious indications of immanent collapse.



Figure 8.12.1 Norwood Tunnel Western Portal.

The west portal of Norwood Tunnel photographed by Hugh Potter in 1972. ((C) Hugh Potter). The site of the Tunnel keepers cottage lay on the left hand side of this view.

8.12.38 The **west (or Norwood) tunnel keepers or inspectors cottage** lay to the north of the canal entrance partly set into the cutting side. The cottage was demolished after 1945 although it is still possible to trace the foundations in the winter when the vegetation is low. Photographic evidence suggests that it was similar in appearance to the early two up / two down lock keepers cottages and comparable to the surviving cottage at Forest Lock.

8.12.39 To the south of the cottage and above the tunnel entrance was a range of **stables**. From a photograph taken in 1903 they appear to have had a brick base and wooden upper parts. The stables were demolished before the cottage and have disappeared from OS survey maps by 1923. Again it is possible to trace the foundations.

#### Standing Remains: Tunnel, Construction Shafts, Mounds, Horse Gins and Kilns

8.12.40 The main **tunnel** when built was described in a contemporary account as being “12ft high and 9ft 3 inches wide” and “in the deepest part 36 yards below the Surface of the Earth”. In 1774 Thomas Quincey records that he was told that its width was about 12ft, however, the width at the surviving portals is approximately 9ft to 9ft 6 inches suggesting Quincey may have confused width and height during his visit.

8.12.41 The **construction shafts** lay fairly evenly spaced along the entire line the tunnel. Although the majority of shafts may be been bricked up at tunnel level and then infilled some circular spoil heaps remained around the shaft site. These are marked on the first edition OS surveys. Thos at the western end of the tunnel line progressively disappear over time. Where later collapse occurred the shafts were infilled by British Coal with mine waste during the 1970’s and 1980’s. Over much of

the western end of the tunnel it is impossible to locate the construction shafts on the surface although they do appear on air photographs as crop marks.

- 8.12.42 The mounds and surface traces in the central area have been eliminated by the tipping from Kiveton Colliery and the subsequent reclamation of the main tip. Some evidence probably survives buried under the main colliery tip which now forms the main landscape feature within the Kiveton Colliery Woodlands.
- 8.12.43 The construction shafts at the eastern end of the tunnel have fared better; between Hard Lane and the Eastern Portal there are an exceptionally well preserved group of construction spoil mounds and shaft heads where it is possible to discern the location of **shafts, horse gins** and **barrow runs** from the surviving earthworks. Horse gins were horse powered winding wheels designed to raise and lower spoil, materials and men. Their use at Norwood is confirmed by *Creswell & Burbage's Nottingham Journal* which records that a sale was held at the eastern portal of the Norwood Tunnel on 31<sup>st</sup> July 1775; this included three Horse Gins and three Water Engine Wheels (Richardson 2009). The remains of these types of work site are often ephemeral and this is a significant survival and deserves better legal protection.
- 8.12.44 It is known from the documentary sources that there were at one point fifteen **brick kilns** operating along the route and that this was later reduced by eleven. The kilns used local clays and coal to produce the roughly three million bricks required to line the tunnel. The kilns themselves have proved hard to locate on the ground and magnetometry is proposed to evaluate possible sites.

#### Standing Remains: East Portal, Tunnel Keepers (Varley's) Cottage & Surround

- 8.12.45 The **East Portal** stands at the current limit of navigation on the British Waterways Canal. It consists of a straight limestone retaining wall in coursed rectangular blocks. In appearance it is the twin of the western portal and is no more adorned. The main arch of the tunnel is roughly central to the wall and is formed of three rings of hard red brick. The entrance itself is infilled with a red brick wall, again installed sometime between 1959 and 1972. The wall has no openings.
- 8.12.46 Above and south of the tunnel line stood the house and office of John Varley, the canal site engineer. This was later used as the **East (Kiveton) Tunnel Keepers Cottage**. This also had a stable block for towing horses but the location is less clear than the house. To the north of the tunnel entrance stood Penny Holme Farm. Both Varley's house and the farm have since been demolished although foundations can be traced.

#### The Tunnel in Context

- 8.12.47 Three long tunnels were opened in 1775:
- Preston Brook (Bridgewater Canal), 1239 yards – February 1775
  - Harecastle (Trent & Mersey Canal), 2880 Yards – April 1775
  - Norwood (Chesterfield Canal) 2880 (2850?) yards – 9<sup>th</sup> May 1775
- 8.12.48 In each case James Brindley was involved in the design or construction, but all were completed by others after his death. While Harecastle took eight years to complete, Norwood was finished in three and a half years – “as such it represents a major

early success in Civil Engineering contracting and in the organisation of labour” (Robertson, 1998).

### **Harthill & Pebley Reservoirs**

- 8.12.49 The summit reservoirs at Pebley and Harthill are still in use and are maintained by British Waterways to supply water to the Kiveton Park to Worksop section of the Chesterfield Canal.
- 8.12.50 The first major canal reservoir schemes were for the Staffordshire & Worcestershire Canal (engineered by James Brindley). Smethwick Great Reservoir and Tifford Reservoir came into use in the Autumn of 1772.
- 8.12.51 The Harthill and Pebley Ponds (reservoirs) were under construction by the Autumn of 1771. Pebley Reservoir was designed to hold over 15 million cubic feet of water, thus considerably exceeding the Smethwick and Tifford Reservoirs and making it the largest reservoir of its kind at the time of construction. The construction of these earth cored dams represented a major Civil Engineering achievement (Robertson 1998).

### **Norwood Reservoirs**

- 8.12.52 When opened the summit pound was fed from the reservoirs at Harthill and Pebley to the south of the canal line via a feeder stream called the Board Bridge Dike. These proved insufficient to supply the demands of both the Norwood Flight to the west and the Thorpe Salvin and Turnerwood Flights to the east. In consequence, new water sources were sought and in March 1785 plans for new reservoirs were presented to the Managing Committee of the Proprietors of the Chesterfield Canal Navigation. The resultant works for the Killamarsh and Woodall Reservoirs and attendant canal feeders were completed the following year.
- 8.12.53 The Killamarsh and Woodall ponds still stand. Both consist of earth bank dams with spillways adjacent to the valley side. In both cases the water level has been dropped and new lower sluices and spillways installed nearer the centre of the earth bank. The original feeder from Killamarsh Pond to the its junction with the feeder from the Woodall Pond can be traced but is not in use. The main feeder from the junction around the contour of Norwood Hill to the head of the Norwood Flight can also be traced but it is now either dry or serves only as a drainage ditch. Both Reservoirs now discharge to the stream known as the County Dike. This stream ultimately discharges into Meadowgate Lake (Rother Valley Country Park) and the River Rother.

### **Church Arm or Church Side Cut**

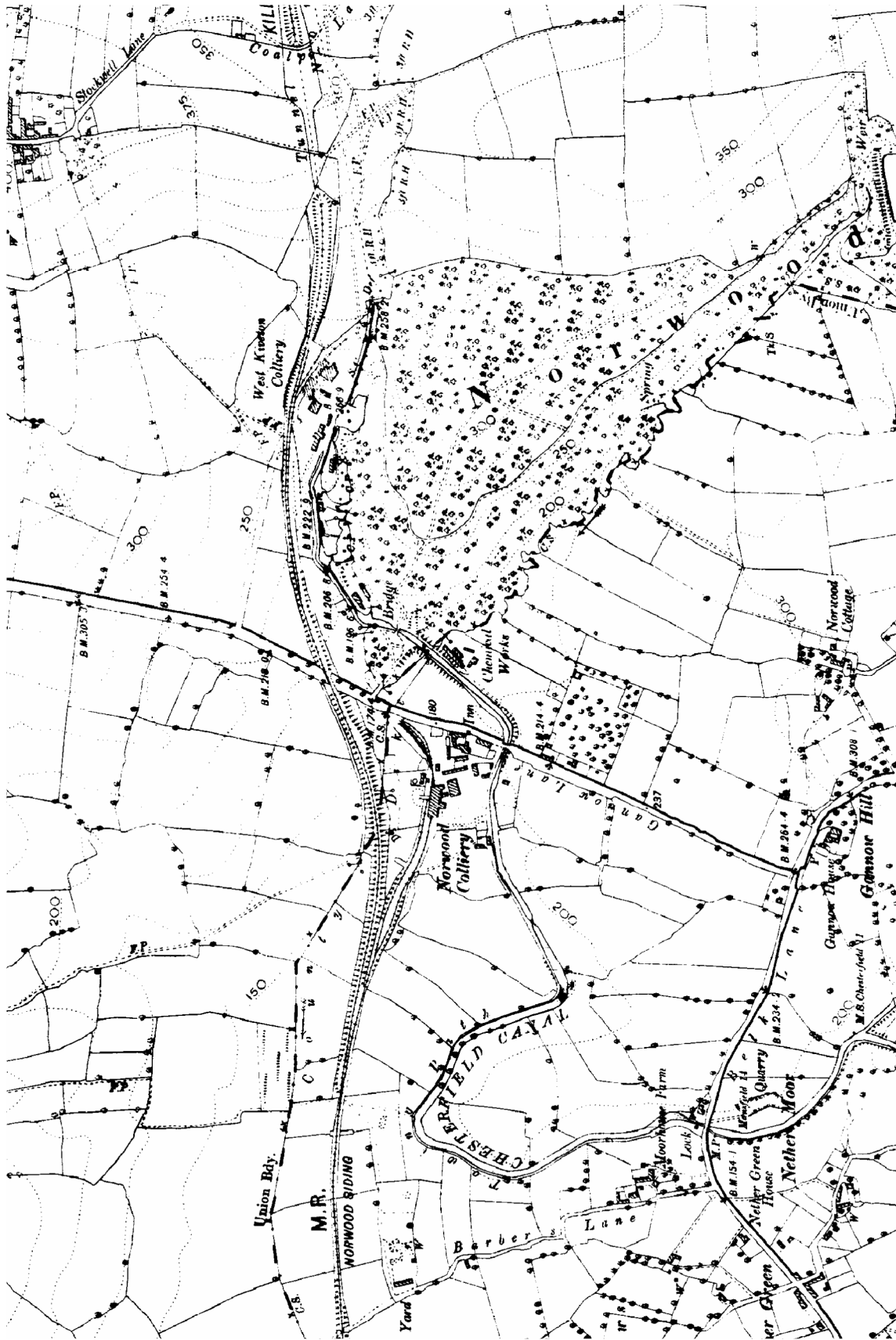
- 8.12.54 The Killamarsh to Kiveton Section also had its own branch canal – the Church Arm or Church Side Cut. This ran from the canal north of St Giles Church, Killamarsh, to the north side of Church Lane and gave access to the foot of the Dale Valley in which there were several coal pits. Its building is recorded in the minutes as follows:
- 8.12.55 12th July 1776: *Ordered That a side Cut be made from the Canal at Norwood end through a Close in the parish of Killamarsh called Butchers Close belonging to his grace the Duke of Leeds into a Close in the same parish belonging to Mr John*

*Billam called the Holt and that Mr. Varley do immediately stake out the same and set out a bridge to be made over it in the road from Gander Lane to Norwood and that Messrs. Billam and Furnis do defray the Expences of the said Cut and Bridge and give Bond in a sufficient Penalty that the said Cut shall not prejudices the Canal and that all persons Navigating thereon shall be subject to the control of the Company of Proprietors of this Navigation. (spelling as original).*

- 8.12.56 The bridge ordered above does not appear to have been built as the canal never passed beyond Church Lane (the “road from Gander Lane to Norwood End”). It appeared that, rather than extend the canal up the Dale valley, a tramway was instead used to link the arm with the local coal pits (see Killamarsh Tramway, above).

### **Other Remains: The Surviving Built Heritage of the Chesterfield Canal outside the immediate Killamarsh to Kiveton Study Area**

- 8.12.57 In Derbyshire the navigation has been derelict over many years, and some structures have been lost. Listed structures that have been restored in the section between Chesterfield and Staveley include Tapton Mill Bridge, St. Helena’s floodgate, and the lock at Tapton.
- 8.12.58 The density of evidence is demonstrated in a recent survey on the section under restoration from Staveley to Killamarsh where nearly 300 features relating to the canal and its feeder tramways have been identified. On the main route the Norbriggs cutting and wharf, the Staveley Puddle Bank (one of the first earth cored load bearing canal embankments in the world) and the remains of the mines and ironworks at Renishaw are of particular note. Very significantly almost the entire length of the 1777 route abandoned when the railway was built has survived and provides a unique insight into the 18th century canal construction – key features include a mystery lock-like structure at Old Boiley Farm Bridge (none is recorded at this point), the Park Brook canal embankment (stone faced) and the almost unique survival of a tramroad transshipment wharf for the Setcup Railway at the site of Old Eckington Bridge.
- 8.12.59 The built heritage of the Chesterfield Canal in the Rotherham area is equally rich and varied, with many of its features being listed structures. These include the flights of locks at Thorpe Salvin and Turnerwood which are thought to be some of the earliest examples of staircase locks in England. Archaeological investigations prior to restoration at Turnerwood have given an insight into how the locks were built and their subsequent history of use and reconstruction. A detailed landscape context study would be of great value in putting these site studies in context.



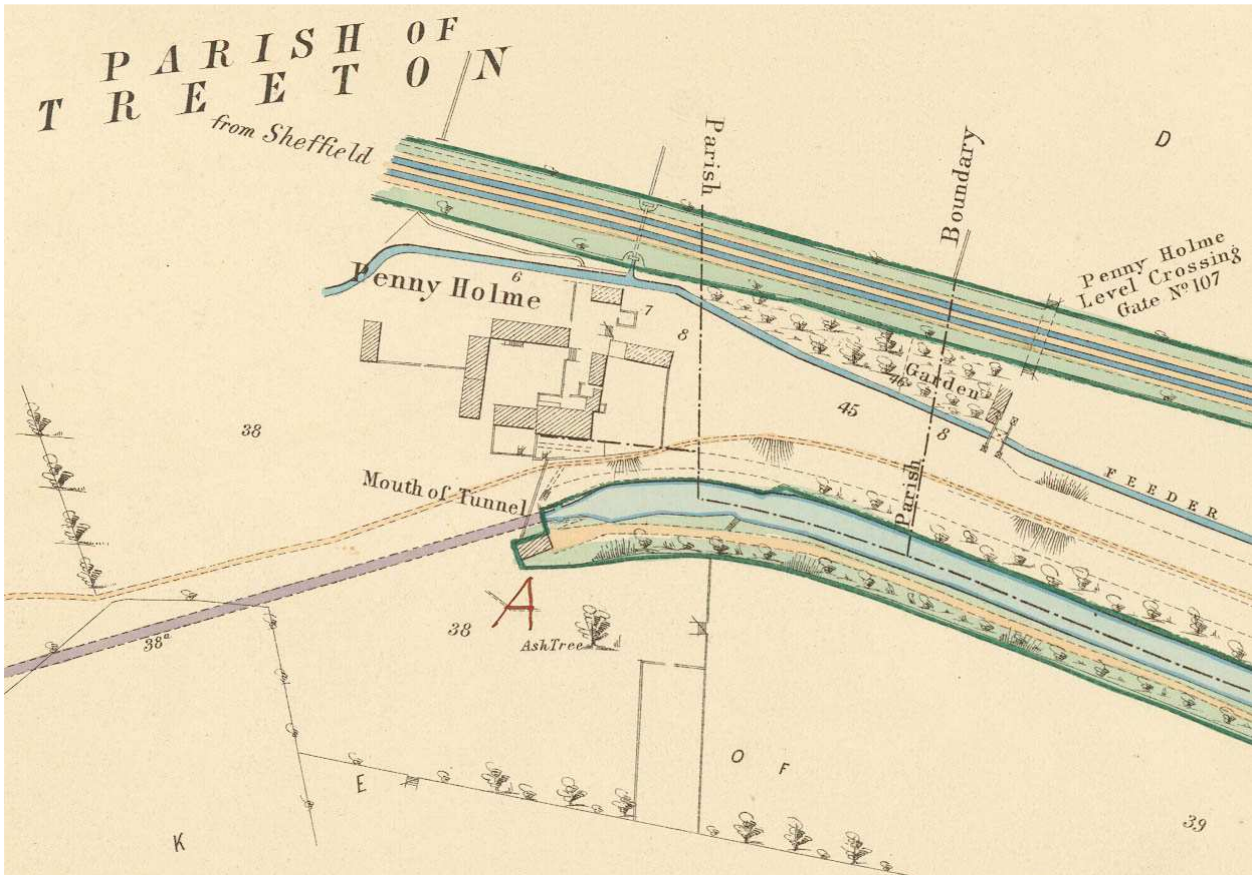
The Norwood Flight circa 1882 (Ordnance Survey 1:10560 Series 1882).



The Norwood Flight circa 1892. Taken from the Fowler Survey for the Manchester Sheffield and Lincolnshire Railway prepared at about the same time as the Derbyshire Lines were being constructed (it shows both pre and post diversion routes). The maps are dated 1892 but were probably surveyed in 1890/91). Compare with Figure Two, Appendix B. The buildings in red were owned by the railway company and formerly belonged to the Canal Company.



The Norwood Canal Feeder and the Woodall and Killamarsh Ponds (reservoirs) circa 1892. Taken from the Fowler Survey for the Manchester Sheffield and Lincolnshire Railway prepared at about the same time as the Derbyshire Lines were being constructed (it shows both pre and post diversion routes). The maps are dated 1892 but were probably surveyed in 1890/91).



The Eastern Portal of the Norwood Tunnel circa 1892. Taken from the Fowler Survey for the Manchester Sheffield and Lincolnshire Railway prepared at about the same time as the Derbyshire Lines were being constructed (it shows both pre and post diversion routes). The maps are dated 1892 but were probably surveyed in 1890/91). Note the cottage by the tunnel entrance and Penny Home Farm both now demolished.

## Assessment of Potential Impact of the Proposed Restoration

### 8.13 Assessment of Potential Impact

#### Protected Sites

- 8.13.1 There are no scheduled ancient monuments in the study area or in the immediate surrounding area.
- 8.13.2 There is one listed building in the canal corridor. This is the grade II listed Norwood Bridge, a good example of a bridge rebuilt in the refurbishment period and dating to 1834. Photographic evidence shows that this structure has recently suffered from vandalism and owner neglect. To date no enforcement action has been undertaken. The bridge is integral to the restoration of the canal which provides an opportunity to take it into sympathetic ownership and restore it to a condition commensurate with its status. The methods used in the restoration of the Thorpe and Turnerwood Flights will also be applied to this structure.
- 8.13.3 Outside the canal corridor and in the immediate surrounding area there are 18 listed structures. None of these will be affected in any way (including during construction) by the restoration of the canal.
- 8.13.4 There are conservation areas in Killamarsh, Wales, and Harthill (but not Woodall) which cover the historic core of each nearby community. Similar protection is given to the historic cores of Barlborough, Thorpe Salvin, Todwick, South Anston & North Anston. Each of these conservation areas lies at a distance from the canal and there is no potential long term impact. In the initial construction phase traffic to the site can largely be directed to use routes which avoid the historic cores of the villages. Where this is not possible (for example through Woodall) strict time and movement number limits will be placed on contractors.
- 8.13.5 It is concluded that the restoration of the canal will have no negative impact on protected sites. In the case of the one listed canal structure, Norwood Bridge, restoration will also serve to protect and repair a structure under threat.

#### Archaeology of the Canal Corridor

- 8.13.6 When placed in a regional context the archaeological record of the canal corridor is not especially rich. Some of this apparent paucity may be the result of archaeological visibility resulting from a local dearth of fieldwork, however, the location of the corridor and the large areas effectively sterilised by opencast coal mining and colliery reclamation works means that inevitably the area as a whole now has several blank spots.
- 8.13.7 No new sites of Prehistoric, Roman or pre-industrial age were located by this survey. This may reflect the degree of industrial-period activity in the landscape around the canal which may have destroyed, buried or modified beyond recognition

earlier features. Further, the landscapes created by industry have now been subject to a succession of “reclamation” schemes which have removed much of the industrial dereliction but have also inevitably also removed or further damaged the vestiges of earlier features.

- 8.13.8 Notwithstanding, there is some scope for the recovery of buried archaeological features in limited areas. These have been identified on the survey maps and will require further investigation prior to the construction phases. These areas lie outside the limits of opencast coal extraction and may also be amenable to fieldwalking. Although the ploughed areas are only a fraction of the route they can provide a further way of picking up sites. Trial walking after heavy rain failed to identify anything other than 20<sup>th</sup> century material, however, it is likely that intensive targeted work will be required to significantly expand the number of smaller sites and isolated find spots on the coal measure soils (Robinson, pers. comm.).
- 8.13.9 The construction footprint of waterways is very small relative to new road construction because the footprint is tightly constrained by the existing boundaries of the canal track (a further benefit of the preferred method of within track working). While some temporary access to the track is required during construction, the restoration is unlikely to impact the archaeological resource of the wider canal corridor. The potential for impact on earlier archaeological periods will obviously be greatest where new lengths of canal are to be constructed.
- 8.13.10 In the west of the division within Killamarsh the preferred route does not impact on any known sites. The new sections of the preferred route are in topographic locations where new sites are unlikely and the potential can be established using test pitting during the detailed design phase. The alternative route crosses one known site, the location of Nethermoor House which was demolished in the 1960's and the site cleared and landscaped. At present we have insufficient data to evaluate the significance of this site and the extent of surviving archaeology. As part of the evaluation of the alternative route a trial excavation and detailed evaluation is proposed.
- 8.13.11 In the east of the division no known archaeological sites will be slighted by the route for the new canal line over the tunnel top between Hard Lane and the Summit of the existing Norwood Flight. There is considered to be scope for the discovery of new archaeological sites in the length from the M1 motorway to the western edge of the reclaimed Kiveton Park Colliery site. This area should be investigated in detail (including geophysics, trial pitting and excavation) during the detailed planning stage. Site identified should be excavated in full. Where no sites were identified in the preliminary stages the potential of this section is such as to warrant a watching brief during construction.
- 8.13.12 Overall, the likely impact of canal restoration upon the archaeological resource of the canal corridor is likely to be very small. Where there is potential for damage to the resource (for example by works access or ancillary works) these this must be mitigated by a programme of detailed site investigation prior to commencement together with a level of watching brief deemed appropriate for each section based upon the evidence and agreed with the relevant archaeological officers of Derbyshire County Council and Rotherham Metropolitan Borough Council.

## Archaeology of the Canal

- 8.13.13 As can be seen from the survey maps relatively few monuments not directly associated with the history of the canal are to be found on the canal track or its immediate surroundings. The key remains affected by restoration will therefore be canal structures; locks, bridges, stop plank narrows, weirs, wharfs, etc.
- 8.13.14 The archaeological record of the canal is very significant. In particular the Norwood Flight is potentially of national heritage importance.
- 8.13.15 The Norwood Flight is arguably a “lost wonder” of the waterways and may uniquely preserve evidence of the operation of an early canal work camp and subsequent company maintenance yard. Most surviving examples of such yards (such as on the Montgomery Canal) relate to much later periods of construction and operation. The relatively limited development of the Norwood Flight after 1830 has preserved this earlier evidence.
- 8.13.16 Although the site appears much damaged by recent works, the majority of the features remain either visible or buried at a shallow depth. Excavation and reconstruction is possible and the opportunity should be taken to record details construction and repair (cf. the work on the Turnerwood Flight by Coxah & Gardner 2004)
- 8.13.17 The current lack of legal protection for most of the canal structures within the track (the exception being Norwood Bridge at the foot of the flight, discussed above) means that the site continues to be degraded. Restoration would provide an opportunity to conduct controlled excavation, undertake heritage standard repairs and ensure the long term survival of the structures.
- 8.13.18 All such works will require preliminary excavation and detailed recorded and the presence of a watching brief during all subsequent works.
- 8.13.19 Following best practice from previous work on the Chesterfield Canal and the Cotswolds Canals the detailed archaeological excavations and recording exercises should be taken in advance of restoration and should feed into the final engineering design and arrangements made for monitoring and recording, should disturbance prove necessary during reinstatement.

## 8.14 Proposed Archaeological Strategy & Mitigation Measures

### Proposed Archaeological Strategy

8.14.1 The archaeological strategy for the project going forward is set out in Part Nine.

### Proposed Mitigation Measures

#### Further Archaeological Investigation Before Commencement of Works

- 8.14.2 In order to formulate a satisfactory heritage management plan for the canal corridor, it will be necessary to gather more information on the extent and condition of the record. This will include;
- 8.14.3 (1). Detailed topographic survey of the Norwood Flight group (including the Woodall and Killamarsh Ponds and canal feeder), the areas around the Tunnel Portals and the Tunnel Top features (especially the eastern spoil tips). This will provide the base line for the detailed investigations below.
- 8.14.4 (2). Excavation and recording of a stratified random sample of test pits in the “archeologically blank” areas along the proposed new route (the tunnel top locations outside the reclamation area of the former Kiveton Park Colliery).
- 8.14.5 (3). Survey of the proposed new build canal corridor employing appropriate combinations of magnetometry, resistivity and ground penetrating radar to ascertain presence of buried features.
- 8.14.6 (4). Surface clearance and vegetation removal from standing structures to permit detailed recording in situ. Where necessary this may lead to;
- 8.14.7 (5). Excavation and archaeological recording of features that will be directly affected by restoration works. The key structures identified to date are the four lock groups of the Norwood Flight and the areas around the Tunnel Portals.

#### Final Revision of Design to Incorporate Heritage Constraints

- 8.14.8 Feed survey and trial excavation data into final engineering design. Seek to moderate impact of restoration through design of structures, choice of appropriate matching materials and method of works.
- 8.14.9 Best practice suggests following the British Waterways methodology previously applied to the Thorpe Salvin and Turnerwood Lock Flights.

#### Formulation of Long Term Heritage Management Plan

- 8.14.10 Employ survey data and trial excavation data to formulate a long term heritage management plan for the lock flight and its environs, setting out desired condition following restoration and appropriate long term management strategy for the structures. The principles of which are set out in Part Nine.

#### During Restoration Works

- 8.14.11 For all works on heritage structures, an archaeological watching brief will be required.

- 8.14.12 Close liaison between engineering teams to permit any required dismantling to be conducted under controlled conditions and with appropriate recording.
- 8.14.13 Reconstruction works should utilise heritage materials and techniques wherever possible and where this is compatible with the requirements of public health and safety.
- 8.14.14 Where extensive reconstruction is required, the new build should be capable of being differentiated from the original fabric of the structure when closely examined.

Post Completion of Works

- 8.14.15 Implementation of the heritage management plan.
- 8.14.16 This to include the regular monitoring of all structures to assess the effectiveness of repair techniques used and to monitor the effects of weathering and use upon the fabric and integrity of the monuments. This data should feed into the five yearly review of the management plan.

