7. Catalogue of Quarry Sites

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Introduction

There are 56 active or recently active aggregates quarries in the study area. The purpose of this catalogue is to provide specific detail about the archaeological potential of each quarry site and how archaeological mitigation works in advance of quarrying have contributed to our understanding of the archaeology of the immediate landscape and region in general. All abbreviations mentioned in the text are listed in Table 7.1. The figure conventions are displayed in Figure 7.0, whilst the distribution and extents of the different quarries are represented in Figures 7.1 and 7.1.1.

The catalogue is presented in two parts (Table 7.2). Catalogue entries 1-40 detail single quarries and their immediate environs, whilst entries 41-47 (covering fifteen quarry sites) present more extensive and more coherent cropmark landscapes, within which archaeological understanding has benefited from the investigations carried out at a number of quarries, or from sites within close proximity.

The first 41 entries are presented by County, whilst the remainder are presented in north to south order. Each entry is split into four basic sections dealing with 'Extraction History', Archaeological Potential', 'Archaeological Investigation' and 'Impact Assessment of Future Extraction'. With regard to the latter, archaeological potential has been expressed subjectively on a scale of High-Moderate-Low, there being insufficient criteria at this stage for being more prescriptive about future archaeological requirements. Any future archaeological mitigation strategies will, in any case, need to be prepared in consultation with the relevant local authority archaeological officers and, where appropriate, with English Heritage. Reference numbers are WYAS database entries.

As a postscript to the catalogue, details of three current planning applications for new quarries within the study area are included.

West Yorkshire

1. Firgreen Quarry (Clifford cum Boston; SE 4375 4464; Fig. 7.2)
*Status***:** Active Sand and Gravel
Solid Geology: Cadeby Formation, Edlington Formation
Drift Geology: Glacial Sands and Gravels
Soil: 511a Aberford Series

Extraction History
Arcon Plant Limited established Firgreen Quarry in 1988 (M. Rathmell pers. comm.) and the site is still operational (Cameron *et al.* 2005).

Archaeological Potential
The archaeological potential of the landscape around Firgreen Quarry is represented by cropmarks to the north and south of the quarry, which depict a trackway (possibly a Roman road) and rectilinear enclosure respectively, each within 300m of the quarry. Other cropmark complexes lie within a 1km radius. A wooded area runs alongside the western edge of the quarry and to the south-west, which would account for the lack of cropmarks in this direction. The Roman road (Rudgate) runs approximately 2km to the east of the quarry that leads to the Roman fort at Newton Kyme (280; Margary 1973). A Roman coin dating to the 2nd century AD has been found 700m to the north-west of the quarry (WY HER PRN, 1950).

Archaeological Investigation
No archaeological investigations have been carried out in association with quarry extraction or for any other purpose in the immediate vicinity. Geophysics and excavations have been undertaken at Newton Kyme Roman fort to the east of the quarry (Bolton and Heathcoat 1978; Simpson 1981; Monaghan 1991; Ref. Nos 1017, 4052, 4012).

Impact Assessment of Future Extraction
As there is little known archaeology in the immediate vicinity of the quarry, the impact level is considered to be low. Despite this, there is evidence for late prehistoric and Roman activity in the surrounding area and any future extraction should include an archaeological mitigation strategy. There are currently no plans for any future work (LCC 2001).

2. Highmoor Quarry (Bramham-cum-Oglethorpe/Tadcaster; SE 4490 4250; Fig. 7.2)
*Status***:** Active Magnesian Limestone
Solid Geology: Cadeby Formation
Drift Geology: N/A
Soil: 511a Aberford Series

Extraction History
Tadcaster Building Limestone Limited established Highmoor Quarry in 1974 and the site remains operational (M. Rathmell pers. comm.). A gravel pit is depicted on the first edition Ordnance Survey map (OS 1849a) on the north-western edge of the current extraction area suggesting the antiquity of quarrying in this vicinity.

Archaeological Potential
The archaeological potential of the Highmoor Quarry landscape is represented by intermittent regular cropmarks that surround the quarry. These depict a ladder-type settlement comprising rectilinear enclosures and trackways orientated in a roughly north-south direction. This is more clearly defined to the north where they are visible within 200m of the quarry, although it is likely that these form part of a wider agricultural landscape hinted at by other cropmarks to the south, which lie on the same alignment. This agricultural regime probably dates to the Iron Age/Roman period. Wooded areas to the west and south of the quarry have hindered cropmark formation.

Two possible east-west Roman roads run within 1km of the quarry leading to Tadcaster. The closest is the Ilkley to York road (72b), which lies approximately 140m to the north, whilst the second is the Scarcroft to Hazlewood road (729), which is situated around 400m to the south. A further Roman road, Rudgate, runs in a north-south direction roughly 1km to the east of the quarry to the Roman fort at Newton Kyme (280; Margary 1973). Whilst the location of these roads remains approximate, it does appear that they overlap the cropmarks and therefore do not respect the pre-Roman land divisions.

Several findspots are known in the area including two Neolithic stone axes (NY HER) 500m and 800m to the north-east of the quarry and prehistoric flints approximately 1km to the east of the quarry (NMR_NATINV-54987).

Archaeological Investigation
No archaeological investigations have been undertaken in association with quarry extraction. An excavation was carried out 500m to the west of the quarry, which revealed evidence of the Ilkley to York Roman road (72b; Margary 1973; Ramm 1976; Ref. No. 5103).

Impact Assessment of Future Extraction

The archaeological potential in the immediate vicinity of the quarry is low to medium, although the wider landscape is considered to be medium to high with the presence of Roman roads, finds and a fort. There are presently no plans in place for any further extraction (LCC 2001). As this quarry straddles both Leeds (West Yorkshire) and Selby (North Yorkshire) Districts, any future mitigation should be considered in both Local Authorities Minerals Plan.

3. Swillington Brickworks (Swillington; SE 3860 3140; Fig. 7.3)

*Status***:** Active Clay and Shale

Solid Geology: Middle Coal Measures

Drift Geology: N/A

Soil: 712a Dale Series

Extraction History

The brickworks were established in 1954 by Armitage Brick Limited, which became a subsidiary of Marshalls plc (Rathmell pers. comm.). Armitage Brick Limited changed its name to Marshalls Clay Products Limited in February 1992, although the Brickworks are now owned by Hanson Brick (Cameron *et al.* 2005, 17). There is a former sandstone quarry located to the south of the present extraction area and a gravel pit to the north that are shown on the first edition Ordnance Survey map (OS 1850a).

Archaeological Potential

The archaeological potential of the area was first realised from cropmarks, which reveal a landscape that was once subdivided by a series of ditched land boundaries and sub-rectangular enclosures that probably dated to the Iron Age/Roman period. These cropmarks are located to the south, west, and south-east of the present quarry. Roman pottery has also been found in the vicinity of the cropmarks from fieldwalking (WY HER PRN, 637).

Archaeological Investigation

Several formal archaeological investigations have been carried out in advance of expansions at the plant. A gradiometer survey was carried out in order to enhance the cropmark enclosure at the southern edge of the quarry. This also revealed further linear anomalies (Abramson 1990a; Ref. No. 2005). Based on this evidence and the cropmark data, an archaeological excavation was carried out on the enclosure and associated features in 1991 by Archaeological Services WYAS and continued in 1992 by York University (Vyner 1992; Ref. No. 5034). This excavated evidence of the enclosure indicated settlement activity within it including a corn drying oven and roundhouses. Pottery from ditch fills were dated from the mid-2nd to mid-3rd centuries AD, although it is likely that activity here pre-dated this. The most recent investigations have been carried out around the north-western side of the quarry in advance of a proposed extension. Here

geophysical survey has identified linear anomalies representing elements of a north-east to south-west trackway with a rectilinear field system to the west and a small sub-rectangular enclosure to the east (Bunn and Palmer-Brown 2006), none of which is revealed in the cropmark record. Recent trial trenching has revealed evidence of post-Roman activity (A. Burgess pers. comm.).

Excavations have also taken place at Bullerthorpe Lane as part of the M1-A1 Link Road to the west of the Brickworks, just 1km to the west of the quarry. A multi-phased site dating from the Iron Age and into the Roman period was uncovered, although the main development at the site dated to between the mid-2nd to early-4th centuries AD. Apart from an unenclosed late Roman roundhouse, there is little evidence for settlement activity with the suggestion that the enclosures functioned for agricultural or stock control purposes (Wheelhouse 2001a, 47; Ref. No. 5024).

The contemporaneity and close proximity of the Swillington Brickworks and Bullerthorpe Lane sites offers the possibility that the two sites form part of the same agricultural landscape though with the enclosures performing different functions. The orientations of the ditches at the two sites, along with other rectangular cropmark enclosures, would also support the notion that they fall under the same management regime.

Impact Assessment of Future Extraction

Extraction will continue in the long-term at Swillington, although there are not, as yet, plans for any further extensions. Indeed, a designated Safeguarding Area surrounds the quarry (LCC 2001). The impact on the archaeology is low to medium in the immediate vicinity of the quarry, although this potential rises to high potential to the south and west.

4. Moss Carr Wood Quarry, Methley Quarry Extension (Methley; SE 3650 2650; Fig. 7.4)

Status: Inactive Sand and Gravel

Solid Geology: Middle Coal Measures

Drift Geology: Till, Glacial Sands and Gravels, River Terrace Deposits, Head

Soil: 711p Dunkeswick Series, 541f Rivington Series, 712a Dale Series

Extraction History

H.J. Banks Limited and Company gained permission to extract sand and gravel here in 2001, although the quarry has now closed (M. Rathmell pers. comm.).

Archaeological Potential

The geology of Methley has resulted in variable cropmark visibility. The gravel terraces to the east have produced good results in places, but on the Middle Westphalian Coal Measures around Moss Carr Wood the cropmarks are more fragmentary, though sufficient to reveal the presence of former land exploitation. The cropmarks here demonstrated a landscape of elongated rectilinear and

curvilinear enclosures and land divisions of probable Iron Age/Roman date. Opencast mining to the north has eradicated any cropmarks that may have existed there.

Archaeological Investigation

Geophysical survey over a sample of the Moss Carr Wood quarry extension revealed little more than had been detected from cropmarks (Webb and Whittingham 2000; Ref. No. 2040). Subsequent trial trenching confirmed that the archaeological potential mainly lay in the areas of three sub-rectangular enclosure complexes (McNaught 2001a; Ref. No. 5014), whilst excavations across a supposed north-south Roman road in this vicinity proved negative (Martin 2000; Ref. No. 5013). Open area excavations were carried out on the three enclosure areas. The westernmost complex contained a succession of roundhouse gullies, some of which were suggestive of conjoined 'figure-of-eight' structures, another displayed a funnel-like entrance arrangement. The central enclosure had only one single roundhouse. No structures were discovered in the easternmost enclosure which was only partly exposed. The occupation is dated on the basis of radiocarbon dating to between 400 BC and 80 AD, although pottery dating indicates that part of the central enclosure was reoccupied in the late Roman period (Roberts and Richardson 2002; Ref. No. 5028). Investigations in advance of a further quarry extension to the west saw additional geophysical survey and trial-trenching work produce little convincing evidence of any settlement in this area (Whittingham 2001a; Ref. No. 2045; Cudlip 2001; Ref. No. 5135). A strip and record operation undertaken during work on the eastern edge of the extraction area did not reveal any archaeology (Roberts 2005a).

Impact Assessment of Future Extraction

Archaeological mitigation has already taken place in advance of extraction. There are no plans for any future extraction at present (LCC 2001), but should this change, there is moderate potential for archaeology in the vicinity.

5. Altofts Brickworks/Newlands Lane Quarry (Normanton/Newland; SE 3785 2250/SE 3655 2184; Fig. 7.5)

Status: Active Clay and Shale

Solid Geology: Middle Coal Measures

Drift Geology: Alluvium, Peat, River Terrace Deposits

Soil: 713a Bardsey Series, 712a Dale Series

Extraction History

Altofts Brickworks is currently owned by Normanton Brick Company Limited and Newlands Lane Quarry is owned by Naylor Clayware Limited (Cameron *et al.* 2005). Several sandstone quarries are depicted on the first edition Ordnance Survey map to the north and south of the present extraction areas (OS 1854).

Archaeological Potential

The archaeological potential of Altofts Brickworks and Newlands Lane Quarry is represented by regular rectilinear cropmarks of ditches and trackways of probable Iron Age/Roman date to the west of Altofts Brickworks and to the north of Newlands Lane Quarry. Some cropmarks also lie within the current extraction area at Newlands Lane Quarry. As there does not appear to have been any archaeological investigations here, it is likely that this archaeology has now been lost. The development of Normanton to the east has deprived us of a more complete picture of the regime of former land division that existed here. This is now limited to the regular field system represented to the south of the urban area, which is aligned in the same direction as the cropmarks to the north. A Bronze Age socketed axe (NMR_NATINV-904476) has been found to the south of the quarries, along with further Bronze Age axes (NMR_NATINV-904478) to the north of the quarries. Roman pottery and metalwork (WY HER PRN, 561) were also found in Newland Park approximately 1km to the west of Altofts Brickworks.

Archaeological Investigation

A geophysical survey (GSB 1997; Ref. No. 2075) and trial trench evaluation (Wild 1997; Ref. No. 5065) were undertaken to the west of Altofts Brickworks at Newland Park, Normanton in advance of coal and clay extraction. These works identified part of a Roman enclosure and later agricultural features. The initial archaeological evaluation by LUAU was supplemented by a photographic survey, which recorded brick kilns, an explosives magazine and a ha-ha. These features were subsequently subjected to a watching brief during stripping (MAP 2002a; Ref. No. 5138). An excavation was also carried out exposing prehistoric and Romano-British features, some of which were previously identified by LUAU (MAP 2002b; Ref. No. 5139). In Area A, flints dating from the Mesolithic to the Bronze Age were recovered, along with Bronze Age pottery. Numerous pits and post-holes were identified; although their function and date could not be interpreted for the most part, Neolithic activity could be assigned to Phase 2 due to radiocarbon dating. In Area B, a rectangular, multi-phased Romano-British enclosure was revealed. Internal features, such as pits,

post-holes and ditches, suggested settlement evidence and supported by pottery finds. An oven indicated industrial activity (MAP 2002b).

Geophysical surveys to the north-west and north-east of the quarries have detected evidence of enclosures and land divisions of possible prehistoric date, some of which correspond with the cropmark data (Finney 1989, 18; Ref. No. 2064; Webb 1998a; Ref. No. 2033).

Impact Assessment of Future Extraction

The archaeological potential at Altofts Brickworks and Newlands Lane Quarry is moderate based on the combined evidence of cropmarks, finds, geophysics and excavation. As indicated in the Unitary Development Plan (LCC 2001), extraction has occurred to the north of these quarries and an appropriate archaeological mitigation strategy has been implemented. Despite this, some archaeology appears to have been quarried away without any mitigation at Newlands Lane Quarry as evidenced by cropmarks within the present extraction area. These cropmarks are known from photographs taken in 1955 and it is likely that extraction took place before any archaeological conditions were required.

6. Park Balk Quarry (Cridling Stubbs; SE 5022 2290; Fig. 7.6)
Status: Active Magnesian Limestone
Solid Geology: Brotherton Formation
Drift Geology: Glacial Sands and Gravels
Soil: N/A

Extraction History

It is currently owned by Plasmor Concrete Products (Cameron *et al.* 2005). Historically, quarrying activity has lain on the rural margins to the south of Knottingley, as depicted on the first edition Ordnance Survey map (OS 1853).

Archaeological Potential

The archaeological potential of Park Balk Quarry is represented by intermittent cropmarks revealing a landscape of rectilinear enclosures and trackways probably dating to the Iron Age/Roman period, which are located to the south of the existing quarry. Similar cropmarks on the same alignment exist to the east, some of which appear to have been quarried away without any archaeological investigation. No cropmarks are known to the west of the quarry, perhaps due to the crop regimes at the times of recording. The only notable spot find has been a Neolithic axe found within the current extraction area (WY HER PRN, 4585).

Archaeological Investigation

A geophysical survey was carried out in advance of proposed extraction to the south-west of the quarry revealing linear anomalies (GSB 1996; Ref. No. 2054). This led to a watching brief in 1998 in which ridge and furrow ploughing was encountered (Timms 1998; Ref. No. 5134). Further watching briefs were carried out in 2003 and 2004 uncovering evidence of former quarrying activity and a limekiln of post-medieval date (OSA 2003a; OSA 2004a; Ref. No. 5070). No archaeological investigations have been carried out on the cropmarks.

Impact Assessment of Future Extraction

The archaeological potential surrounding this quarry is considered to be of low to medium value. As this quarry straddles both West Yorkshire and North Yorkshire, any future mitigation needs to be considered by both Wakefield Metropolitan District Council and North Yorkshire County Council. There are currently no plans for any extensions at this quarry.

7. Nostell Brickworks (Foulby; SE 4008 1700; Fig. 7.7)

Status: Active Clay and Shale

Solid Geology: Middle Coal Measures

Drift Geology: N/A

Soil: 712a Dale Series, 541f Rivington Series

Extraction History

Ibstock Brick Limited currently own Nostell Brickworks (Cameron *et al.* 2005).

Archaeological Potential

From the cropmark evidence, the greatest archaeological potential would seem to lie to the south-east of the present extraction area where two clusters of enclosures are situated. One of these appears to comprise two D-shaped enclosures, one of which contains a concentration of discrete anomalies and is perhaps a settlement. The other cluster of sub-rectangular enclosures appears to be associated with the wider field system, which is clearly not contemporary with the D-shaped enclosures. It is possible that the cropmarks represent a late prehistoric settlement and subsequent Romano-British field system. A wooded area is located to the north of the quarry concealing any potential archaeology in this area.

Archaeological Investigation

A desk-based assessment hinted at the archaeological potential of the area, which was followed by a watching brief in advance of extraction (JSAC 2001; 2002; Ref. No. 5137). This watching brief revealed natural and modern man-made features, which corresponded with the alignments of some of the cropmarks. Further phases of extraction are intended over the next twenty years, which are to be archaeologically monitored (JSAC 2002; Ref. No. 5137).

Impact Assessment of Future Extraction

The archaeological potential to the south-east is considered to be medium to high, based on the cropmark data. The current plan is to extend extraction at Nostell Quarry in this direction and the proposed archaeological mitigation strategy comprises geophysical surveys and trial trenching.

8. Brackenhill Quarries (Ackworth; SE 4320 1650; Fig. 7.8)

Status: Active Sandstone

Solid Geology: Middle Coal Measures

Drift Geology: N/A

Soil: 541f Rivington Series

Extraction History

These quarries have been worked since the 1850s by Brackenhill Quarries, who originally came from Derby, and are still operational. The sandstone was originally quarried for millstones and later for ornamental masonry (WY HER PRN, 6544).

Archaeological Potential

There is little archaeological potential around this quarry with few visible cropmarks in the vicinity. Cropmarks of a double-ditched linear feature and curvilinear enclosure with an internal curvilinear feature, probably a roundhouse, exist 900m to the south-west of the quarry. The curvilinear plan of the enclosure may suggest an earlier Iron Age date. The quarry is partly enveloped within the urban area of Ackworth Moor Top, although ploughed fields are present to the north and south.

There is industrial interest at this quarry with the survival of two steam-cranes and a frame-saw. The frame-saw dates to the 1920s and was originally steam-driven. It still utilises abrasive, rather than diamond blades to cut the stone (WY HER PRN, 6544).

Archaeological Investigation

A site assessment was carried out in 1997 as part of a Monument Protection Plan report which records the remains of 19th and 20th-century machinery associated with quarrying and stone masonry (English Heritage 1999). No archaeological investigations have been carried out in association with quarry extraction. A watching brief and evaluation were undertaken on the eastern edge of Ackworth Moor Top, 1km to the east of the quarry, revealing evidence of a 19th-century mill (FAS 2002; Ref. No. 5058; FAS 2005a; Ref. No. 5062).

Impact Assessment of Future Extraction

The current evidence for Brackenhill Quarries suggests there is low potential for archaeology. Any future extensions may require some form of low level mitigation strategy, although no plans are in place for any future mineral extraction.

North Yorkshire

9. Smaws Quarry (Tadcaster; SE 4620 4300; Fig. 7.9)
Status: Inactive Magnesian Limestone
Solid Geology: Cadeby Formation
Drift Geology: N/A
Soil: 511a Aberford Series

Extraction History

Ripon and Beverley Minsters were constructed using Magnesian Limestone from Smaws Quarry during the medieval period (Page 1974, 377). Quarrying was therefore already well-established in the area by the time the first edition Ordnance Survey map was published in which a number of quarries are depicted, particularly to the south and west (OS 1849a). The present workings were owned by Redland Aggregates in the 1990s (NYCC 1997) and are currently owned by Samuel Smith's Brewery (A. Shaw pers. comm.), although extraction has now discontinued (Cameron *et al.* 2005).

Archaeological Potential

Intermittent cropmarks of rectilinear and linear features of probable Iron Age/Roman date are present within a 1km radius of the quarry. Although cropmarks do exist at the northern edge of the quarry, in the wider landscape, further similar cropmarks are located 600m to the south-east of the quarry. The quarry lies in the north-eastern angle of the intersection of two Roman roads: Margary's 72b and 280 (known as Rudgate). The former is almost tangential to the western side of the quarry and there is thus significant potential for Roman archaeology in the vicinity. Finds of flints (NMR_NATINV-54987) have been made to the south-west and an Iron Age beehive quern was found to the north-west of the quarry (WY HER PRN, 5125).

Archaeological Investigation

Archaeological interventions have been carried out since 1992 when a watching brief was undertaken targeted on geophysical anomalies (Shiel 1992; Ref. No. 1025), although no archaeological features were encountered (Finney 1992; Ref. No. 4063). Unstratified finds were recovered during the topsoil stripping dating from the Bronze Age onwards including flints and pottery (Finney 1992). Subsequent watching briefs took place in 1993 and 1994 on cropmarks in advance of quarrying to the north-west, which identified areas of burning, flint artefacts, and

Roman pottery suggesting settlement activity (Finney 1993; 1994; Ref. Nos 4063 and 4071). This was followed by trial excavations which revealed evidence of field boundaries dating to the Iron Age/Roman period (Finney 1994).

A proposed north-eastern extension to the quarry resulted in an archaeological desk-based assessment, followed by fieldwalking and a geophysical survey (MAP 1996a; Ref. No. 1024). The geophysical survey revealed anomalies that have been interpreted as a settlement complex, trackway and field boundaries of unknown date. Subsequent excavation confirmed the results of the geophysical survey, finding ditches of Roman date and evidence for occupation (MAP 1997c; Ref. No. 4072).

An evaluation and watching brief were later undertaken in advance of extraction to the north of the quarry revealing linear ditches relating to a field system. Finds of samian pottery and coins date these ditches to the Roman period (Parry 2001b; Ref. No. 4016).

Impact Assessment of Future Extraction

As archaeological work has already been undertaken in advance of extraction, the historic environment surrounding the quarry is known to date to the Iron Age/Roman period. The potential for further archaeological remains is moderate based on the cropmark data and excavations. It should be noted that the cropmark record here provides a rather abbreviated impression of the archaeology revealed by the geophysical survey work. There are no current plans for any future extraction (NYCC 1997).

10. Jackdaw Crag Quarry (Stutton with Hazlewood; SE 4650 4150; Fig. 7.9)
Status: Active Magnesian Limestone
Solid Geology: Cadeby Formation
Drift Geology: N/A
Soil: 511a Aberford Series

Extraction History

Jackdaw Crag Quarry, also known as Thevesdale, supplied stone that was used to build York Minster from at least the 13th century (Page 1974, 376) indicating the antiquity of extraction in the area. Indeed, it has been suggested that quarrying has been undertaken here since Roman times (LUAU 1999). In the later Middle Ages, the quarries at Hazlewood were owned by the Vavasour family (Parsons 1990, 12), although Jackdaw Crag Quarry has been owned by Darrington Quarries Limited since the 1970s (B. Binstead pers. comm.). Several limestone quarries are shown on the first edition Ordnance Survey map to the south-east and north-east of the present quarry (OS 1849b). Permitted extraction exists to 2014 (Gresty 2006b).

Archaeological Potential

The archaeological potential at Jackdaw Crag Quarry is represented by cropmarks of an enclosed rectilinear field system orientated in a roughly east-west direction to the north and west of the quarry. The closest cropmarks lie within 100m of the northern edge of the quarry. The cropmarks to the east are rather fragmentary, although traces of a double-ditched linear feature, probably a trackway, lie within 20m of the quarry edge. Cropmarks of two linear banks running to the north-west of the quarry have been interpreted as Roman roads. The nearest, running north-south is Margary's (1973) 28b, which is within 80m of the quarry. Beyond this is a series of potential east-west land boundaries (one being Margary's 729) that may be Roman roads dividing legionary pastures (Ramm 1976), whilst another north-south road is the road leading to the Newton Kyme fort (Margary's 280). The cropmark regime here appears to pre-date the linear roads and boundaries, suggesting a pre-Roman Iron Age field system that has been impinged upon by the Roman roads.

Archaeological Investigation

Although it seems likely that linear features represented by cropmarks may have extended into the quarry, no archaeological investigations have been carried out in association with extraction as no archaeological conditions have been attached to the permission (B. Binstead pers. comm.). Excavations have been carried out on Roman road 280 (Rudgate) to the west of the quarry to establish its location (Dymond 1961; Ref. No. 4008). Wetherby Historical Society carried out a further excavation at Toulston Park to the immediate north of the previous excavation revealing the eastern ditch of the road and finds of Romano-British pottery (Ramm 1976, 12; Ref. No. 4010). The locations of both these excavations correspond with the north-south linear bank (Margary's Roman road 280) mapped from aerial photography.

Impact Assessment of Future Extraction

The archaeological potential in the immediate vicinity of the quarry to the south and east is low, although to the north and west it must be regarded as medium to high based on the cropmark data and presence of the Roman roads. The quarry lies in a designated Area of Search for further extraction (NYCC 1997) and an application for a proposed southern extension has been submitted (Gresty 2006b). No archaeological conditions are attached to the planning permission.

11. Old London Road Quarry (Stutton with Hazlewood; SE 4750 4050; Fig. 7.9)
*Status***:** Inactive Magnesian Limestone
Solid Geology: Cadeby Formation
Drift Geology: Alluvium, Glacial Sands and Gravels
Soil: 511a Aberford Series

Extraction History
A quarry is depicted on the first edition Ordnance Survey map (OS 1849b) suggesting that extraction has been carried out here since at least the mid-19th century. The quarry was originally known as Windmill Quarry, but it was renamed Old London Road Quarry in 1967 (A. Shaw pers. comm.). It was operated by Webfell Waste Management Limited in the 1990s, although extraction discontinued in 2005 (NYCC 1997).

Archaeological Potential
Intermittent and fragmentary cropmarks in the wider landscape of the quarry comprise rectilinear and curvilinear enclosures and trackways of probable late prehistoric or Roman date, although none lies within 500m of the quarry. A Bronze Age axe hammer (NMR_NATINV-54962) has been found to the south of the quarry. The projected line of the Castleford to York Roman road (28b, Margary 1973) is also located approximately 1.3km to the north-west.

Archaeological Investigation
No archaeological investigations have been undertaken in association with extraction or for any other purpose in the immediate vicinity.

Impact Assessment of Future Extraction
The archaeological potential in the immediate vicinity of the quarry is presently considered to be low, whereas its surrounding landscape has moderate potential. This quarry lies within a designated Area of Search (NYCC 1997) and further extraction may occur in the future.

12. Copley Lane Quarry (Barkston Ash; SE 4820 3490; Fig. 7.10)
Status: Inactive Magnesian Limestone
Solid Geology: Brotherton Formation
Drift Geology: N/A
Soil: 511a Aberford Series

Extraction History
Copley Lane Quarry was established prior to planning control in 1947 (A. Shaw pers. comm.). It was owned by C.F. Harris Limited until recently (NYCC 1997), but has since closed down (Cameron *et al.* 2005). Several limestone quarries are depicted on the first edition Ordnance Survey map to the south and north of the present quarry (OS 1850b).

Archaeological Potential
There is significant archaeological potential at this quarry with cropmarks reflecting the presence of linear boundaries and rectilinear enclosures in the immediate vicinity of the quarry. Indeed, a trackway runs in an east-west direction into the eastern edge of the quarry. An additional trackway runs in a north-south direction on the north-western edge of the quarry. Within the wider landscape lies a rectilinear enclosure with internal divisions and further trackways lie just 400m to the north-west, whilst 600m to the south-west is a double-ditched sub-rectangular enclosure with discrete anomalies indicating settlement. The irregular pattern of these cropmarks suggests a late prehistoric agricultural landscape.

Archaeological Investigation
No archaeological investigations have been undertaken in advance of extraction or for any other purpose in the vicinity of the quarry.

Impact Assessment of Future Extraction
The potential for archaeology is moderate to high in the immediate vicinity of the quarry based on the cropmark data. This quarry lies within a designated Area of Search (NYCC 1997).

13. Sherburn Quarry (Sherburn-in-Elmet; SE 4850 3300; Fig. 7.10)
Status: Inactive Magnesian Limestone
Solid Geology: Brotherton Formation, Edlington Formation
Drift Geology: N/A
Soil: 511a Aberford Series

Extraction History
Sherburn Quarry was established prior to planning control regulations in 1947 (A. Shaw pers. comm.). Several limestone quarries are depicted on the first edition Ordnance Survey map (OS 1850b) in the vicinity of the quarry suggesting extraction since at least the mid-19th century. Documentary evidence suggests quarrying has occurred here since the 14th century (NY HER PRN, 9413). Dumpall owned the quarry in the 1990s (NYCC 1997), but it is now inactive (Cameron *et al.* 2005).

Archaeological Potential
There is archaeological potential in the form of intermittent cropmarks of linear, rectilinear and curvilinear features to the south, west and east of the quarry, which are of probable Iron Age/Roman date. Those about 600m to the west are more coherent and reveal a nucleated field system comprising conjoined rectilinear enclosures, trackways and discrete anomalies. They suggest a largely agricultural landscape with potential settlement activity.

Archaeological Investigation
No archaeological investigations have been carried out in association with extraction. An excavation approximately 500m to the north-east of the quarry revealed two Romano-British burials and sarcophagi (MAP 1997a; Ref. No. 4028) indicating settlement activity in the vicinity. To the east of this, further excavations have uncovered Iron Age/Romano-British enclosure ditches indicating agricultural and settlement activity (MAP 1998; MAP 2000a; Ref. No. 4024; MAP 2003a; Ref. No. 4020).

Impact Assessment of Future Extraction
The archaeological potential is considered to be moderate with the presence of a curvilinear feature immediately east of the quarry. There are no plans in place for any further work.

14. Betteras Hill Quarry (Hillam; SE 4965 2932; Fig. 7.11)
Status: Inactive Magnesian Limestone
Solid Geology: Brotherton Formation
Drift Geology: N/A
Soil: 511a Aberford Series

Extraction History
Betteras Hill Quarry was established prior to planning control regulations in 1947 (A. Shaw pers. comm.). Earthstrip Minerals owned the quarry in the 1990s (NYCC 1997), but it was owned by Thorne Environmental more recently (A. Shaw pers. comm.), although the quarry is no longer active (Cameron *et al.* 2005). Multiple quarries are depicted on the first edition Ordnance Survey map in the vicinity of Betteras Hill Quarry (OS 1850b) suggesting extraction here since the mid-19th century.

Archaeological Potential
The closest cropmarks to Betteras Hill Quarry are located approximately 700m to the south and north-west of the quarry. Those to the north-west are rather fragmentary, but to the south lies a more coherent field system of rectilinear fields with corner enclosures of likely Iron Age/Roman date. One of the field boundaries appears to cut a large circular feature, about 40m in diameter, which may represent an earlier prehistoric ritual monument.

Archaeological Investigation
No archaeological investigations have been carried out in advance of extraction or for any other purpose in the vicinity of the quarry.

Impact Assessment of Future Extraction
The archaeological potential at this quarry is considered to be low to moderate based on the available data. There are no plans in place for any further work.

15. Brotherton/Foxcliffe/Byram Park Quarry (Brotherton; SE 4900 2647; Fig. 7.11)
Status: Active Magnesian Limestone
Solid Geology: Brotherton Formation
Drift Geology: Glacial Sands and Gravels, Glaciolacustrine deposits, Peat, Till
Soil: 511a Aberford Series, 543 Arrow Series

Extraction History
Foxcliffe Quarry gained planning permission prior to planning control in 1947 and several extensions have been added over the years. One of the most recent extensions has been to the north, which is also known as Byram Park. Foxcliffe Quarry was bought by Darrington Quarries Limited in the late 1970s from Hinchcliffe's Quarry (B. Binstead pers. comm.). Extensive limestone quarrying is known at Foxcliffe Quarry with multiple quarries shown on the first edition OS map (OS 1852), some of which overlap with the current extraction areas. Others are located to the north, north-west and west of the present quarry. Indeed, the first edition OS map annotates the quarry to the west as 'Coppering Kilns' and may suggest copper working or copperas manufacturing in the area. Documentary evidence suggests that quarrying has occurred since the 14th century in Brotherton parish for lime production (Yarwood 1981, 41).

Archaeological Potential
The cropmark record in this area is variable. Intermittent linear and rectilinear cropmarks located to the north of Foxcliffe Quarry first hinted at ditched land divisions and trackways of probable Iron Age/Roman date. These are orientated in an east-west direction and can probably be linked with similar cropmarks about 1km to the north-east which suggest an extensive agricultural landscape.

Archaeological Investigation
For the western part of the site two desk-based assessments have been carried out in advance of extraction (Atkinson 1995; Fletcher and Keith 1997) resulting in a requirement for a geophysical survey and trial trenching (Fiorato 1995), although ultimately only strip and record operations have been undertaken. The first phase of strip and record work was carried out in the northern part of Foxcliffe Quarry revealing evidence of a trackway that corresponded with cropmarks (O'Neill 1998a, Ref No: 4054). Two further strip and record operations uncovered more of the trackway and associated field system (Howell and Cudlip 2001; Ref. No. 4055; McNaught 2001b; Ref. No. 4055). A further strip and record event in 2002 uncovered more evidence of ditched land divisions (Dean 2003; Ref. No. 4068).

A further desk-based assessment and walkover survey was commissioned for a north-eastern extension to the quarry, the walkover survey yielding only a single flint flake. The assessment report recommended a geophysical survey and rectification of the aerial photographs (May 2003). North Yorkshire Heritage Unit proposed that rectification of the aerial photographs should be

done, but advised against a geophysical survey, partly due to the presence of a high pressure gas pipeline in the area which would cause some disturbance to the data (Wheelhouse 2005b). As the cropmark record was minimal it was subsequently agreed that the site would be investigated through a phased archaeological strip and record operation. To date two phases of strip and record have been carried out in advance of extraction in 2005 and 2006, and further phases of work are likely to be carried out over the next decade.

Both events have revealed extensive archaeological finds and have warranted full open-area excavation of Romano-British enclosure and field ditches. Associated with these have been corn driers, Roman pottery (including samian) and metalwork, as well as several human burials, all of which suggest a settlement in the close vicinity (ASWYAS in prep.; Ref. No. 4064). The archaeological interventions here have highlighted that sub-surface archaeological deposits are very much present, despite the paucity of the cropmark data.

Impact Assessment of Future Extraction

There is a Preferred Area for further extraction to the north of Foxcliffe Quarry and to the south-west of the excavations at Byram Park (NYCC 1997). As the Minerals Local Plan is almost a decade old, this information is out-dated and the Preferred Area has now been quarried out (YHRAWP 2006). An archaeological mitigation strategy is in place, approved by North Yorkshire County Council's Heritage Unit, to continue to strip and record any further quarry extensions over the next ten years (Wheelhouse 2005b) with high potential for archaeology.

16. Darrington Quarries (Cridling Stubbs; SE 5103 2113; Fig. 7.6)
Status: Active Magnesian Limestone
Solid Geology: Brotherton Formation, Roxby Formation, Edlington Formation
Drift Geology: Till
Soil: 511a Aberford Series, 711p Dunkeswick Series

Extraction History

Quarrying is shown on the first edition Ordnance Survey map at several locations in the vicinity of and within the present extraction area (OS 1853). Originally, there were several separate quarries here, but these are now part of the Darrington Quarries complex (SLR Consulting Limited 2001). The southern part of the current extraction area included the former Stapleton Quarry, where extraction is known from documentary sources to have occurred since the 14th century (LUAU 1999). Stone from this quarry was used for the construction of various notable buildings including Windsor Castle, York Minster and Eton College (LUAU 1999). The quarries have been owned by Darrington Quarries Limited since 1957 (B. Binstead pers. comm.) and the current workings are permitted until 2010 (Gresty 2006b).

Archaeological Potential

Intermittent cropmarks of ditched rectilinear enclosures and trackways of probable Iron Age/Roman date surround the boundaries of the quarry complex. These cropmarks can probably be linked to the wider mixed field system which starts to become more coherent within 1km to the south-west of the quarry. To the south of the quarry, finds of a prehistoric handaxe (NMR_NATINV-56074) and a beehive quern of probable Iron Age date were recovered (NY HER). A hoard of Roman coins was found several metres to the east of the quarry (NMR_NATINV-56248). The findspot was subsequently excavated revealing 3300 coins and their container, a 4th-century calcite gritted jar (Butler and Radley 1968, 127; Ref. No. 4057).

Archaeological Investigation

Archaeological investigations began at the southern edge of the quarry in the 1960s after two beehive querns and Roman pottery sherds were uncovered during topsoil stripping in advance of extraction (Buckland and Dolby 1987, 1; Ref. No. 4011). Limited excavations were subsequently carried out revealing stone-built structures, a T-shaped corn-drier, and ditches suggesting the presence of a Romano-British farmstead. A magnetometer survey, carried out in the field to the north of the excavation, failed to locate any further features and the area has since been quarried away (Buckland and Dolby 1987).

Two geophysical surveys have been undertaken on a western extension of the quarry (Boucher and Webb 1991; Ref. No. 2000; Webb 1995a; Ref. No. 1001), although no archaeology was encountered. Several watching briefs have taken place on the eastern extension, although no archaeology was encountered despite the area having contained known cropmarks of a double-ditched linear feature within the proposed extraction area (O'Neill 2000, Ref. No.: 4066). A later watching brief did reveal some linear features, although it would appear that the cropmarks have been largely ploughed out (McQueen 2002; Ref. No. 4069).

The northern extension saw an initial desk-based assessment and walkover survey carried out, the walkover producing a single Neolithic flint core (NAA 2003a). Geophysical scanning indicated possible archaeological anomalies but the area was not subjected to a detailed geophysical survey due to deep ploughing being carried out prior to the operation. A written scheme of investigation proposed a three-phased strip and record investigation (Roberts 2003a), two phases of which have since been undertaken revealing a well of probable post-medieval date (ASWYAS in prep. b).

Impact Assessment of Future Extraction

The potential for archaeology is considered to be moderate in the immediate vicinity of the quarry. This is evidenced by intermittent rectilinear and curvilinear cropmarks to the south and west of the existing quarry workings. A Preferred Area was designated by North Yorkshire County Council's planning team to the north of the existing quarries (NYCC 1997). This area is now owned by Darrington Quarries Limited and extraction has followed the phased archaeological investigations.

A Buffer Zone has been allocated to the south of the existing extraction area (NYCC 1997), whilst a Safeguarding Area and an Area of Search have been assigned to the west of the quarry in West Yorkshire (WMBC 2003). Darrington Quarries Limited has submitted an application for a north-western extension (B. Binstead pers comm.). An archaeological mitigation strategy is in place for any future extraction in North Yorkshire.

17. Went Edge Quarry (Smeaton Limeworks) (Kirk Smeaton; SE 4996 1722; Fig. 7.12)
Status: Active Magnesian Limestone
Solid Geology: Cadeby Formation
Drift Geology: N/A
Soil: 511a Aberford Series

Extraction History
Several limestone quarries are depicted on the first edition Ordnance Survey map (OS 1853) indicating continued extraction in this area since at least the mid-19th century. Small-scale quarrying was established prior to planning control regulations in 1947 (A. Shaw pers. comm.). Current extraction was granted permission in 2002 and is worked by Ennstone Johnston Limited (Gresty 2006b), although it was previously owned by T & T Aggregates and Yorkshire Minerals and Reclamation (A. Shaw pers. comm.).

Archaeological Potential
The most significant archaeological site in the immediate vicinity of the quarry is a potential Iron Age hillfort known as Castle Hill (Keighley 1981, 117). Earthworks of an enclosure and possible annexe are known within a bend on the River Went from the first edition Ordnance Survey map (OS 1853). Unfortunately, most of these features have since been quarried away without any archaeological record, although some features may survive to the north of the quarry, or be preserved beneath the quarry compound on the south-west side of the quarry. Two further rectilinear enclosures are known from cropmarks less than 250m to the east of the possible hillfort and may be associated with it. A double-ditched feature, possibly representing a trackway, also runs to the east of the quarry and may be associated with the enclosures.

Additional regular, rectilinear and linear cropmarks of an enclosed field system linked by trackways are present to the south and south-east of the quarry. These are probably part of a wider Iron Age/Roman agricultural landscape on the south side of the Went. Discrete anomalies within a rectilinear enclosure to the south-east of the quarry may be pits and suggest settlement activity. A prehistoric flint has been recovered in the immediate vicinity of the quarry (NMR_NATINV-54180), whilst a flint knife was found to the north-east of the quarry (Thorp 1974, 142).

Archaeological Investigation

An archaeological assessment was carried out in advance of extraction revealing evidence of a ditch, although no dating evidence was recovered (Noel 1994; Ref. No. 4070). Geophysical survey (Hancock 2002; Ref. No. 1006), watching briefs and excavations (Gidman and Whittaker 2004; Ref. No. 4003) were undertaken to the east of the quarry in advance of further quarry expansion. The investigations were targeted on cropmarks revealing two ditched enclosures with no internal features or artefacts suggesting that they functioned as livestock enclosures. Although some of the ditches appear to be segmented, this may be a consequence of truncation by deep ploughing.

Impact Assessment of Future Extraction

The potential for archaeology in the immediate vicinity is moderate based on the cropmark data and previous archaeological investigations, although the surrounding landscape is considered to be moderate to high. An application for a southern extension has been submitted to the Planning Department in an area containing no cropmarks (Gresty 2006b). A condition comprising an archaeological evaluation has been attached to the planning permission (NY Planning File).

South Yorkshire

18. Campsall Quarry (Norton; SE 5334 1336; Fig. 7.13)
Status: Inactive Magnesian Limestone
Solid Geology: Brotherton Formation
Drift Geology: Till, Head
Soil: 511a Aberford Series

Extraction History

An application for limestone extraction was submitted by Tilcon Limited in 1993, but the application was eventually withdrawn.

Archaeological Potential

Intermittent cropmarks of an enclosure complex have been revealed by aerial photography within the proposed quarry area. These comprise rectilinear and curvilinear enclosures and land divisions of probable Iron Age/Roman date. These cropmarks are orientated in a south-east/north-west direction and probably form part of the same landscape as the more extensive mixed field system to the north. Numerous limestone quarries are shown on the first edition Ordnance Survey map (OS 1854b). The Castleford to York Roman road (28b) is located several kilometres to the west of the quarry (Margary 1973). Several Roman coins have been recovered to the north-east of the proposed extraction area dating to the 3rd and 4th centuries (NMR_NATINV-56132; Doncaster Museum).

Archaeological Investigation

An initial desk-based assessment and subsequent geophysical survey revealed that the site had significant archaeological potential, particularly from the late prehistoric period onwards (Adams *et al.* 1992; Ref. No. 3042). The geophysical survey data considerably enhanced the detail of the cropmark enclosure in the north-western corner of the site, showing it to have a very irregular plan of at least two phases, which was accessed by a meandering double-ditched trackway. Subsequent trial excavations confirmed the geophysical survey results. It is likely that this enclosure complex dated to the Late Iron Age period, although no dating evidence was recovered to support this (Adams *et al.* 1992; Ref. No. 3042; Morris *et al.* 1992; Ref. No. 6004).

Impact Assessment of Future Extraction

There is high potential for archaeology in the Campsall area based on the combined evidence. There are no plans for any future extraction at this site.

19. Suttonfield (Sutton) Quarry (Norton; SE 5440 1300; Fig. 7.13)

Status: Active Magnesian Limestone

Solid Geology: Brotherton Formation

Drift Geology: N/A

Soil: 511a Aberford Series

Extraction History

The first edition Ordnance Survey map depicts several quarries to the east of the current extraction area (OS 1854b). The quarry was originally known as Twinstone Quarry and is also referred to as Sutton Quarry. Suttonfield Quarry has been owned by Darrington Quarries Limited since the late 1970s and permission has been granted for an extension to the west (B. Binstead pers. comm.).

Archaeological Potential

Fragmentary cropmarks of linear features, located to the north, south and west of the quarry, have been interpreted as land divisions and trackways, although rectilinear and curvilinear enclosures are present 400m to the south-west. Several linear features are located within the current extraction area and appear to have been quarried away without any archaeological mitigation. A limestone quarry is depicted on the first edition Ordnance Survey map (OS 1854b) indicating the antiquity of quarrying in the area. Several Bronze Age flints have been found through fieldwalking to the east of the quarry (Van de Noort and Ellis 1997, 232). A Roman bronze brooch and a Roman coin (Doncaster Museum) have been found to the north-east of the quarry by metal detectorists. A Roman brooch was also discovered by a metal detectorist (PAS, SWYOR-17CDF5) to the south of the quarry.

Archaeological Investigation

No archaeological investigations have been carried out in association with mineral extraction at Suttonfield Quarry. Whilst the Sites and Monuments Record was consulted, no archaeological condition was recommended (CSL Surveys 1990). The nearest archaeological investigations have been undertaken to the north-west in advance of a proposed quarry at Campsall, which has been discussed above.

Impact Assessment of Future Extraction

The archaeological potential to the north of the quarry is moderate, given the fragmentary nature of the cropmarks and the general absence around the immediate quarry margins. There are no plans in place for any further mineral extraction at this site.

20. Hatfield Quarry (Hatfield; SE 6680 0845; Fig. 7.14)

Status: Active Sand and Gravel

Solid Geology: Sherwood Sandstone

Drift Geology: River Terrace Deposits

Soil: 551b Cuckney Series

Extraction History

Sand and gravel extraction has been undertaken at Hatfield Quarry since at least 1949 with three planning permissions granted between 1949 and 1961. An application was submitted in 1994 by L. Lanni Limited to replace the old permissions, which were granted in 1995. T & T Aggregates have operated at the quarry since 1996 (DMBC 2003).

Archaeological Potential

The archaeological potential for Hatfield Quarry appears relatively low with no cropmarks within 700m of the quarry. It is uncertain as to why there are no cropmarks as the geology and soils are conducive to cropmark formation (Riley 1980, 2) and may instead be explained by more recent land use practices. The nearest cropmarks lie to the west in the form of an irregular field system on the northern edge of Dunsville Quarry (approximately 1km to the south-west). It is likely that there was other activity in the area as Roman pottery has been found to the north of the quarry and two Roman coins were found to the west (Doncaster Museum). A Roman brooch was also recovered from a cropmark complex about 1.3km to the north-east (Doncaster Museum).

Archaeological Investigation

No archaeological investigations have been carried out in advance of extraction or for any other purpose in the vicinity of the quarry.

Impact Assessment of Future Extraction

The archaeological potential is low in the immediate vicinity of the quarry on the basis of the cropmark evidence. Despite this, cropmark evidence in the wider landscape suggests a higher level of archaeological potential.

21. Cadeby Quarry (Cadeby; SE 5216 0020; Fig. 7.15)

Status: Active Magnesian Limestone

Solid Geology: Cadeby Formation, Upper Coal Measures

Drift Geology: N/A

Soil: 511a Aberford Series

Extraction History

Several limestone quarries and sand pits are known from the first edition Ordnance Survey map to the south, east and west of the present quarry (OS 1854c). The quarries at Cadeby are well-known and are mentioned in the Victoria History of the Counties of England:

'The Cadeby quarries there supply a rather friable cream-coloured stone; the central beds are said to be the best. In the last century it was employed in London and Edgware.' (Page 1974, 48)

The quarry is thought to have been established in the 19th century when it was used for obtaining building stone, but as the quarry expanded, the dolomite was used in the glass industry (Hart 1988). It is currently owned by Lafarge Aggregates Limited for aggregates and some building use (Cameron *et al.* 2005, 48).

Archaeological Potential

There are cropmarks around 2km to the north-east and north-west and 500m to the south-east of the quarry revealing rectilinear and curvilinear enclosures and trackways of probable Iron Age/Roman date. The lack of cropmarks in the immediate vicinity of the quarry is partly explained by the presence of wooded areas to the north, east and west, along with former quarry workings to the west.

Numerous finds have been recovered in the immediate vicinity of the present quarry. These include several Mesolithic and Neolithic flints (Moorhouse 1979, 1; Doncaster Museum), Roman pottery (Doncaster Museum) and Roman coins (Doncaster Museum; Jones 1980, 181). The latter have been recovered to the south-west and north-east of the quarry (Doncaster Museum) and include several coin hoards. This evidence, in conjunction with the other Roman finds (including a brooch and a glass bead), strongly indicates Roman activity in the area.

Archaeological Investigation

No archaeological investigations have been carried out in conjunction with extraction at this quarry. Excavations have been undertaken at a rock shelter at Scabba Wood 1.5km to the north of

the quarry where several Neolithic and Bronze Age burials have been uncovered (Chadwick 1992; Ref. No. 6078; Parker Pearson 1998; Ref. No. 6079).

Impact Assessment of Future Extraction

The archaeological potential is moderate due to the concentration of finds, particularly Roman, in close proximity to the quarry. As Cadeby Quarry is encircled by a designated Buffer Zone to restrict development around the quarry, it is possible that further extraction will occur in the future.

22. Warmsworth Quarry (Levitt Hagg, Warmsworth Cliff, The Dolomite Quarry) (Warmsworth; SE 5370 0050; Fig. 7.15)
Status: Active Magnesian Limestone
Solid Geology: Cadeby Formation
Drift Geology: N/A
Soil: 511a Aberford Series

Extraction History

Extraction began in the mid-18th century at Levitt Hagg Quarry, Warmsworth with few technological changes until the 1950s (Latham 1994, 43). The quarries at Warmsworth are annotated Far Cliff Quarries on the first edition Ordnance Survey map (OS 1854c). Pilkington Quarries Limited operated at the quarry from the 1980s, but it is now worked by WBB Minerals (Cameron *et al.* 2005). In 2005, a determination of conditions was submitted by WBB Minerals, which was accepted including an archaeological condition (05/02864/REV).

Archaeological Potential

Intermittent cropmarks of rectilinear and linear features are visible 700m to the north-east and south-west where there are also extant earthwork remains, although none has been identified in the immediate environs. The town of Warmsworth is located to the south-east of the quarry and a wooded area lies to the west and north, which would explain the lack of cropmarks in these areas. Spot finds include a Neolithic flint tanged arrowhead to the south-west of the quarry (NMR_NATINV-620976), a prehistoric flint lance point, prehistoric flint flakes, and Roman coins to the north-east of the quarry (Doncaster Museum).

Archaeological Investigation

The only archaeological investigation carried out at the quarry was a survey of kilns used for limeburning dating to the Industrial period (Latham 1994, 43). A specification for an archaeological walkover survey and examination of the quarry face was submitted recently (APS 2006), although the work has yet to be carried out.

Impact Assessment of Future Extraction

The archaeological potential at Warmsworth Quarry is relatively low, based on the little evidence present in the immediate vicinity. As there is a Buffer Zone surrounding the quarry to restrict non-mineral development (Skinner 1998), it is possible that further extraction may be undertaken at some stage. Whilst little archaeology is indicated in the immediate vicinity of the quarry, there are a number of finds associated with both this quarry and the adjacent Cadeby Quarry.

23. Wroot Road Quarry (Blaxton; SE 6872 0045; Fig. 7.16)

Status: Active Sand and Gravel

Solid Geology: Sherwood Sandstone

Drift Geology: River Terrace Deposits, Glaciolacustrine Deposits

Soil: 821b Blackwood Series

Extraction History

Planning permission was granted in 1949 to Blaxton Sand and Gravel Company Limited by Nottinghamshire County Council, which included Bank End Quarry to the south. St Ives Sand and Gravel operated at Wroot Road Quarry during the 1950s and 1960s; the quarry was subsequently taken over by Bardon Aggregates (A. Burton pers. comm.). Joseph Metcalf Limited operated the quarry in the 1990s (97/46/1877/P), but it is currently owned by Yorkshire Aggregates Limited who have extracted sand and gravel here since 2001 (A. Burton pers. comm.).

Archaeological Potential

There are no cropmarks in the vicinity of the quarry as there are wooded areas to the west and north-west (not depicted). A Neolithic stone axe has been recovered to the north-east of the quarry (Doncaster Museum).

Archaeological Investigation

A geophysical survey has been undertaken to the east of the quarry in advance of extraction in which several linear anomalies of uncertain date or function were detected (Stratascan 2003; Ref. No. 3068). Fieldwalking at the quarry has produced finds of flint dating from the Mesolithic to the Bronze Age (TVAS 2003; Ref. No. 9012).

Impact Assessment of Future Extraction

The archaeological potential is low to moderate in the immediate vicinity of the quarry. This quarry lies in a designated Safeguarding Area (Skinner 1998), although permission was granted in 2004 to extract further reserves (YHRAWP 2006), which has an archaeological condition attached (L. Matthews pers. comm.).

24. Bank End Quarry (Finningley; SE 6850 0000; Fig. 7.16)
Status: Active Sand and Gravel
Solid Geology: Sherwood Sandstone
Drift Geology: River Terrace Deposits
Soil: 821b Blackwood Series, 712i Foggathorpe Series

Extraction History
The first planning application was issued by Nottinghamshire County Council in 1949 to the Blaxton Sand and Gravel Company Limited in conjunction with Wroot Road Quarry. This site originally functioned as the processing facility for Wroot Road Quarry to the north (A. Burton pers. comm.). A determination of the conditions was reviewed in 1997, although no archaeological conditions were attached. Bank End Quarry is currently owned by Fernwood Aggregates Limited (Cameron *et al.* 2005).

Archaeological Potential
Intermittent cropmarks to the south of the quarry depict a rectilinear field system and enclosures and ditches of probable Iron Age/Roman date. A Neolithic flint barbed-and-tanged arrowhead has been found to the south-east of the quarry (Doncaster Museum). A Roman bronze bracelet and pottery have been recovered to the west of the quarry (Doncaster Museum; Dolby 1969, 238).

Archaeological Investigation
No archaeological investigations have been carried out in association with extraction at Bank End Quarry. Geophysical survey and excavations have been carried out within 200m of the southern end of the site in advance of quarrying at Finningley Misson Grange Quarry (Webb and Whittingham 2001a; Ref. No. 3052; MAP 2003b; Ref. No. 6145). These revealed ditches dating to the Roman period and a post-medieval brick production site.

Impact Assessment of Future Extraction
Whilst there are few cropmarks in the vicinity of the quarry, there is known archaeology to the south suggesting that the archaeological potential is moderate. The quarry is surrounded by a Safeguarding Area (Skinner 1998).

25. Austerfield Quarry (Austerfield; SK 6570 9515; Fig. 7.17)
Status: Active Sand and Gravel
Solid Geology: Sherwood Sandstone
Drift Geology: Glacial Sands and Gravels
Soil: 541r Wick Series

Extraction History
Sand extraction has occurred in the Austerfield area since the 1940s under an Interim Development Order (DR 149). The first planning application was submitted by Spacebulk Limited in 1991 (91/06/0795/MIN), followed by a further application in 1993 by ARC Limited (93/06/1955/MIN). This latter application involved consultation with the South Yorkshire Sites and Monuments Record, who highlighted the presence of cropmarks in the vicinity. This resulted in the attachment of an archaeological condition to the permission for Hanson Aggregates – North, who have operated at the quarry since 1999 (Cameron *et al*. 2005).

Archaeological Potential
Intermittent rectilinear and linear cropmarks are located within the north-eastern part of the current extraction area, which appear to have already been quarried away. More extensive and more coherent cropmarks are present within 1km west where the north-south Roman road (28b, Margary 1973) also ran. Wooded areas, located to the west of the quarry, and the expansion of urban areas to the south may explain the lack of cropmarks in these areas. A Neolithic flint knife has also been found to the west of the quarry (Doncaster Museum).

Archaeological Investigation
Two watching briefs have been undertaken in advance of extraction on the eastern edge of the quarry revealing ditches dating to the Iron Age/Roman period (SYAS 1997; Ref. No. 6147; NAA 2000; Ref. No. 6148). These correspond with the cropmarks, although no plans were available from these reports for mapping purposes.

A geophysical survey and evaluation were carried out on cropmarks 0.5km to the south-west of the quarry in advance of a residential development on the northern outskirts of Bawtry (Webb 1998b; Ref. No. 3062; Stone 1998; Ref. No. 6120). These, again, uncovered evidence of ditches of probable Iron Age/Roman date.

Impact Assessment of Future Extraction
The archaeological potential in the immediate vicinity of the quarry is considered to be low, although the potential increases in the wider landscape, especially to the west. Austerfield Quarry is encircled by a designated Safeguarding Area (Skinner 1998).

26. Holme Hall/Batty Holt/Glen/Stainton Quarries (Stainton/Braithwell; SK 5480 9520; Fig. 7.18)

Status: Active Magnesian Limestone

Solid Geology: Cadeby Formation, Edlington Formation

Drift Geology: N/A

Soil: 713g Brickfield Series, 511a Aberford Series, 711c Brockhurst Series

Extraction History

Numerous limestone and sandstone quarries are depicted on the first edition Ordnance Survey map surrounding the present extraction area (OS 1854d). The first permission was obtained under an Interim Development Order in 1948, followed by a further six applications. Tarmac Quarry Products Limited operate at Holme Hall (Batty Holt) Quarry, whilst Glen (Stainton) Quarry has been operated by Marshalls Mono Limited since 1969 (Cameron *et al.* 2005).

Archaeological Potential

Intermittent rectilinear and curvilinear cropmarks are located to the north, east and west of the quarry including several circular enclosures, which may indicate a domestic or ritual component to the agricultural landscape. Further extraction of uncertain material, possibly coal, exists to the south of the quarry prohibiting cropmark formation (not digitised). Wooded areas are present to the south, south-east and north of the quarry hindering cropmark development in these areas.

Numerous Palaeolithic and Mesolithic flints, a Neolithic stone axe, and prehistoric flint flakes were recovered from the wider landscape to the north of the quarries (Doncaster Museum; Thorp 1974, 141), along with Roman pottery, coins and a brooch (Doncaster Museum). The prehistoric finds tend to be located more to the north-west, whilst the Roman finds are generally clustered to the north-east. A single Mesolithic flint has also been found to the south (NMR_NATINV-620282).

Archaeological Investigation

A desk-top assessment was undertaken in advance of a northern extension at Holme Hall Quarry (Symonds 1993). A fieldwalking exercise produced several sherds of Roman pottery (Merrony 1994; Ref. No. 9054), followed by a geophysical survey (Gaffney 1994; Ref. No. 3082) and excavation. The excavation revealed evidence of enclosure ditches and a kiln, but no structures. Despite this, the site has produced over 5000 sherds of mainly 2nd to 3rd-century pottery, thousands of animal bones, quernstones, as well as more unusual finds such as a copper-alloy dragonesque brooch and styli, all of which suggest a Romanised homestead (ARCUS forthcoming). A number of negative archaeological interventions have taken place in the vicinity (ARCUS 1996b; Ref. No. 6139; Thompson 2004; Ref. No. 6130; Toase and Stanley 2004; Ref. No. 6131; ARCUS forthcoming; Ref. No. 6091; Barker 2005; Ref. No. 3040). Romano-British archaeology is known at Edlington Wood, near Old Edlington, to the north of the quarry, where

several enclosures, including extant earthworks and walls, have been surveyed and excavated (Corder 1951; Sumpter 1973).

Impact Assessment of Future Extraction

The archaeological potential is considered to be low to moderate based on the cropmark data and known archaeology in the area. There is a Preferred Area to the north of the quarries, which is surrounded by a Buffer Zone (Skinner 1998).

27. Maltby Brickworks (Maltby; SK 5120 9270; Fig. 7.19)

Status: Active Clay and Shale

Solid Geology: Upper Coal Measures

Drift Geology: N/A

Soil: 511a Aberford series, 541f Rivington Series, 712a Dale Series

Extraction History

Extraction commenced at Maltby Brickworks prior to planning control in 1947 (B. Peace pers. comm.) and is currently owned by Ibstock Brick Limited (Cameron *et al.* 2005). Historically, limestone extraction was undertaken to the east of the present quarry as evidenced by the first edition Ordnance Survey map (OS 1854d).

Archaeological Potential

As Maltby Brickworks are flanked by the towns of Maltby and Hellaby, cropmarks can only be visible in the ploughed fields to the north and south. Intermittent cropmarks are located within 1km to the south of the Brickworks, comprising a D-shaped enclosure, a curvilinear enclosure/barrow, rectilinear enclosures and land divisions of probable Iron Age/Roman date. Further similar cropmarks are present 1km to the north-west indicating a settled agricultural landscape. Although the immediate cropmarks are fragmentary, a geophysical survey 1.5km to the south-west (GSB 1998, Ref No: 3006) suggests that they may be part of a more extensive rectilinear field system. Mesolithic flints have been recovered to the south of the quarry (NMR_NATINV-620300), whilst a Neolithic polished stone axehead (Rotherham Museum) and a Roman coin (2nd century AD) (NMR_NATINV-319061) have been found to the east of the quarry.

Archaeological Investigation

An environmental assessment was undertaken in advance of extraction, which highlighted the potential for archaeology in the area (Wardell Armstrong 2000), although no subsequent archaeological investigations were carried out.

Archaeological investigations in the vicinity include a geophysical survey and evaluation at Hellaby Hall to the west of the Brickworks, which revealed medieval activity (GSB 1998; Ref. No. 3006; SYAU 1991; Ref. No. 6047). Earlier agricultural activity has also been indicated by a geophysical survey and evaluations at Denby Way, Hellaby with the discovery of an enclosed field system of uncertain date (Webb 1996a; Ref. No. 3017; Holbrey 1996; Ref. No. 6038; Stone 1997; Ref. No. 6039). It is likely that this agricultural regime is connected to the field system witnessed to the west at Bramley, where a number of archaeological investigations have confirmed its presence (Webb 1994; Ref. Nos 3065 and 6127; Howell and Morris 1999; Ref. No. 6003; Staddon and Webb 1993; Ref. Nos 6128 and 3066; Mc Cluskey and Schofield 2003; Ref. No. 6126; EAS 1999; Ref. No. 3004, 3014 and 3009; Burgess 1999a, Ref. No. 6044).

Impact Assessment of Future Extraction

The archaeological potential appears to be low to moderate in the immediate vicinity of the Brickworks, due largely to the built environment that already borders the quarry to the west and east. There is a designated Buffer Zone surrounding the Brickworks to protect the area from non-mineral development (RMBC 1999).

28. Harris Quarry (Blackamoor, Aston, Ulley) (Ulley; SK 4583 8770; Fig. 7.20)

Status: Active Sandstone Quarry

Solid Geology: Middle Coal Measures

Drift Geology: N/A

Soil: 541f Rivington Series

Extraction History

Several sandstone quarries are shown on the first edition Ordnance Survey map to the north of the present extraction area (OS 1855). Research by the Harris family suggests that the land was owned by Lord Halifax at this time, who may have extracted stone from here. Indeed, it is known that extraction commenced at Harris Quarry prior to planning control in 1947 (B. Peace pers. comm.). The quarry has been in the Harris family since 1971 (P. Harris pers. comm.).

Archaeological Potential

There is archaeological potential within 1km to the north of the quarry in the form of a rather mixed and fragmentary group of enclosures and field boundaries. There is a reservoir that lies to the west and north of the quarry, although ploughed fields exist to the east and south. A Roman coin hoard has also been found *c*. 0.5km to the north-west of the quarry (NMR_NATINV-316286) with further Roman coins being found 0.5km to the south-east (NMR_NATINV-316289).

Archaeological Investigation

No archaeological investigations have been carried out in association with extraction or for any other purpose in the vicinity of the quarry.

Impact Assessment of Future Extraction

Whilst there is low potential for archaeology in the immediate vicinity of the quarry, the landscape to the north has moderate potential, although no plans are in place for any future extensions.

Nottinghamshire

29. Finningley Quarry (Misson Grange) (Misson; SK 6790 9731; Fig. 7.21)
Status: Active Sand and Gravel
Solid Geology: Sherwood Sandstone
Drift Geology: Glaciolacustrine deposits, River Terrace Deposits
Soil: 712i Foggathorpe Series, 821b Blackwood Series, 851c Downholland Series

Extraction History

Extraction in the Finningley/Misson area extends back to at least the 1930s and has since been superseded by numerous quarries over the years. Lafarge Aggregates Limited currently owns Finningley Quarry (Cameron *et al.* 2005).

Archaeological Potential

Some intermittent cropmarks are known immediatey north of the quarry, but otherwise there is little compared to the dense and extended brickwork plan that exists 2.5km to the west. Much of the landscape to the east has already been quarried away without any record, although the quarry does appear to lie within a landscape that was either largely devoid of field boundaries or, more likely, has not been conducive to cropmark formation. That the quarry area is not devoid of archaeology is indicated by the presence of a number of stray finds which include a Neolithic barbed-and-tanged arrowhead and flints to the north-east of the quarry (Doncaster Museum), a beehive quern of possible Iron Age date, to the east of the quarry (NMR_NATINV-320786), and sherds of Roman pottery to the north and east of the quarry (Doncaster Museum; NMR_NATINV-320786). Archaeological investigation has not proved fruitful.

Archaeological Investigation

A number of archaeological interventions have taken place in advance of extraction. Three watching briefs to the west of the quarry did not reveal any archaeology (Walker and Woodhouse 1994; Ref. No. 327; TPAT 1995; Ref. No. 322; Challis 1996; Ref. No. 314). Geophysical surveys also to the west revealed curvilinear and linear anomalies, along with industrial activity (Webb 2000a; Ref. No. 3050; Whittingham 2001b; Ref. No. 3051; Webb and Whittingham 2001a; Ref.

No. 3052), whilst a geophysical survey to the north in the Preferred Area did not indicate any archaeology (Webb 2001a; Ref. No. 3053). Several evaluations and watching briefs were carried out following the surveys, with Roman ditches and a pit identified to the north of the quarry in the Safeguarding Area, but no archaeology to the west (MAP 2000b; Ref. No. 6149; MAP 2000c; Ref. No. 6150; MAP 2003b; Ref. No. 6145). Field walking was also undertaken, but did not recover any significant finds (MAP 2000d; Ref. No. 9013).

Impact Assessment of Future Extraction

The archaeological potential is low, based on the existing cropmark data and archaeological evidence recovered so far. There is a Preferred Area to the north of the quarry, where a geophysical survey did not reveal any archaeology (Webb 2001a; Ref. No. 3053). Permission has now been granted to extract sand and gravel in this area (YHRAWP 2006). There is also a Landbank in the general area around the quarry to reserve the resource (NCC 2005). As this quarry straddles the Doncaster district, Finningley Quarry also lies within a Safeguarding Area in Doncaster district (Skinner 1998).

30. Newington Quarry (Misson; SK 6750 9595; Fig. 7.21)

*Status***:** Active Sand and Gravel

Solid Geology: Sherwood Sandstone

Drift Geology: Glaciolacustrine Deposits, Peat

Soil: 712i Foggathorpe Series, 551b Cuckney Series

Extraction History

Extraction commenced in 1986 by Lafarge Aggregates Limited (W. Allum pers. comm.). Several quarries are illustrated on the first edition Ordnance Survey map to the west of the current extraction area (OS 1854e).

Archaeological Potential

Cropmarks of rectilinear enclosures and linear ditches represent an ancient field system of probable Iron Age/Roman date about 400m to the south-west of Newington Quarry. These are probably associated with similar cropmarks that exist at Austerfield Quarry indicating a wider agricultural regime, perhaps an extension to the brickwork plan to the west. Roman pottery has been found at two locations to the east of the quarry (NMR_NATINV-320761; NMR_NATINV-320748).

Archaeological Investigation

No archaeological investigations have been carried out in advance of extraction or for any other purpose in the vicinity of this quarry.

Impact Assessment of Future Extraction

There would seem to be little potential for archaeology in the vicinity of the quarry, although this increases to moderate where there are known cropmarks to the south-west. The quarry lies in a general Area of Search (NCC 2005).

31. Bryan's Close Quarry (Misson; SK 6780 9510; Fig. 7.21)

Status: Inactive Sand and Gravel

Solid Geology: Sherwood Series

Drift Geology: River Terrace Deposits

Soil: 551b Cuckney Series

Extraction History

Extraction commenced in the early 1970s by Earthstrip Limited (W. Allum pers. comm.), but was later taken over by Lafarge Aggregates Limited (Cameron *et al.* 2005).

Archaeological Potential

No cropmarks are shown in the vicinity, although Roman pottery has been found to the north-east of this quarry (NMR_NATINV-320761).

Archaeological Investigation

No archaeological investigations have been carried out in association with extraction at this quarry. Cropmarks of rectilinear enclosures and linear ditches represent an ancient field system of probable Iron Age/Roman date about 400m to the south-west of Newington Quarry. These are probably associated with similar cropmarks that exist at Austerfield Quarry indicating a wider agricultural regime, perhaps an extension to the brickwork plan to the west. Evidence for Roman agricultural activity has been found to the immediate south at the adjoining quarry of Misson Bawtry Road (Keith *et al.* 2000a; Ref. No. 4; Gidman 2002; Ref. No. 313).

Impact Assessment of Future Extraction

The archaeological potential of Bryan's Close Quarry is low due to the lack of cropmark data. The quarry lies within a general Area of Search (NCC 2005).

32. Finningley Quarry (Bawtry Road) (Misson; SK 6810 9500; Fig. 7.21)

Status: Active Sand and Gravel

Solid Geology: Sherwood Sandstone

Drift Geology: River Terrace Deposits

Soil: 551b Cuckney Series

Extraction History

Extraction began at Bawtry Road in the late 1930s by Associated Quarzites. It has since been owned by Yorkshire Amalgamated Products and Steetley Dolomite Limited (W. Allum pers. comm.). This latter company was taken over by Redland Aggregates in 1992, which was subsequently acquired by Lafarge Aggregates Limited in 1998, who currently own the quarry (W. Allum pers. comm.).

Archaeological Potential

Some intermittent cropmarks are known to the immediate north of the quarry, but otherwise there is little compared to the dense and extended brickwork plan that exists 2.5km to the west. Much of the landscape to the east has already been quarried away without any record, although the quarry does appear to lie within a landscape that was either largely devoid of field boundaries or, more likely, has not been conducive to cropmark formation. Roman pottery has been found to the north of the quarry (NMR_NATINV-320761).

Archaeological Investigation

No archaeological investigations have been carried out in advance of extraction. A watching brief was undertaken to the east of the quarry in which no archaeology was uncovered (TPAT 1994a; Ref. No. 319).

Impact Assessment of Future Extraction

The archaeological potential at this quarry appears to be low based on the present cropmark data and previous interventions. This quarry lies in a general Area of Search (NCC 2005).

33. Misson Bawtry Road (Rowley) (Misson; SK 6764 9488; Fig. 7.21)

*Status***:** Active Sand and Gravel

Solid Geology: Sherwood Sandstone

Drift Geology: River Terrace Deposits, Peat

Soil: 551b Cuckney Series, 1022b Altcar Series

Extraction History

Extraction commenced in the 1990s under the ownership of the Misson Sand and Gravel Company (W. Allum pers. comm.).

Archaeological Potential

No cropmarks are visible in the immediate vicinity of the quarry. As the area has been extensively quarried over the years, it is likely that any cropmarks have been truncated, although land use may also be a factor.

Archaeological Investigation

Extraction at Bawtry Road has involved a series of archaeological interventions comprising two desk-based assessments, a palaeoenvironmental assessment, fieldwalking, and a geophysical survey (Colcutt and Griffiths 1993; Keith *et al.* 2000a; Ref. Nos 4 and 603). Although neither study anticipated any significant archaeology, a subsequent strip and record operation identified ditches containing pottery of Roman date (Gidman 2002; Ref. No. 313). This evidence contradicts the preliminary archaeological assessments and highlights the importance of a combined approach. Several quarry extensions have since seen a programme of phased watching briefs carried out, none of which has found any archaeology, although this process is ongoing (Rose forthcoming, Project No: 2941).

Impact Assessment of Future Extraction

The archaeological potential is low to moderate due to the excavation of Roman period ditches, the extrapolation of which is not supported by the cropmark data. The quarry lies in a general Area of Search for sand and gravel (NCC 2005).

34. Misson West Quarry (Misson; SK 6830 9480; Fig. 7.21)

*Status***:** Active Sand and Gravel

Solid Geology: Sherwood Sandstone

Drift Geology: River Terrace Deposits, Peat

Soil: 551b Cuckney Series, 1022b Altcar Series

Extraction History

Extraction at Misson West began in the early 1980s by ARC Northern Limited (W. Allum pers. comm.) and is now owned by Hanson Aggregates - North (Cameron *et al.* 2005).

Archaeological Potential

No cropmarks have been identified in the vicinity of this quarry, mainly due to quarrying activity in the area and its proximity to the village of Misson.

Archaeological Investigation

No archaeological investigations have been carried out in advance of extraction. A negative watching brief was undertaken to the north-east of the quarry (TPAT 1994a; Ref. No. 319), but the evidence from the adjacent site at Misson Bawtry Road (Cat. No. 33) suggests that some archaeological remains may have existed in the southern part of the quarry at least.

Impact Assessment of Future Extraction

The archaeological potential for Misson West Quarry is low. A general Area of Search is designated for the Misson area (NCC 2005).

35. Newington North Quarry (Misson; SK 6790 9420; Fig. 7.21)

*Status***:** Active Sand and Gravel

Solid Geology: Sherwood Sandstone

Drift Geology: Peat, River Terrace Deposits

Soil: 1022b Altcar Series, 551b Cuckney Series

Extraction History

Extraction commenced in 2001 by Hanson Aggregates plc (W. Allum pers. comm.).

Archaeological Potential

Cropmarks of sub-rectangular enclosures with aggregated sub-enclosures forming a small settlement nucleus are located at the south-western edge of the quarry and may represent part of a wider field system almost certainly dating to the late prehistoric/Roman period. Further linear and rectilinear features are present to the south of the quarry. Several finds have also been noted in the vicinity of Newington North Quarry including a finds scatter of uncertain date to the west of the quarry (N HER PRN, 5569), a Neolithic find to the south of the quarry (N HER PRN, 5097), a Bronze Age palstave (N HER PRN, 5074) and Roman pottery to the west of the quarry (N HER PRN, 5074a).

Archaeological Investigation

A geophysical survey has been carried out on cropmarks at the southern extremity of the quarry, but the anomalies (discrete and linear) do not reflect the cropmark plan and therefore remain of uncertain date and function (GSB 2000; Ref. No. 5). Subsequent trial trenching did not reveal any archaeology (NAA 2002; Ref. No. 323) and it is likely that the geophysical anomalies are due to natural phenomena. A later watching brief did find a linear ditch which corresponds with the south-west side of the main cropmark enclosure (NAA 2003b; Ref. No. 316), whilst a subsequent watching brief found undated oak timbers (Simpson 2004; Ref. No. 329). Two watching briefs were carried out to the west of Newington North Quarry, but were not associated with extraction (TSAC 1998; Ref. No. 320; Allen 2000; Ref. No. 328). A single flint find was the only archaeology recovered from these interventions (Allen 2000).

Impact Assessment of Future Extraction

The archaeological potential of Newington North Quarry is moderate based on the presence of cropmarks. There is a Preferred Area to the south-east of Newington North Quarry (NCC 2005).

36. Newington 2 Quarry (Misson; SK 6690 9436; Fig. 7.21)
Status: Active Sand and Gravel
Solid Geology: Sherwood Sandstone
Drift Geology: River Terrace Deposits
Soil: 821b Blackwood Series, 1022b Altcar Series

Extraction History
Newington 2 Quarry forms part of the Newington Quarry complex owned by Lafarge Aggregates Limited (NCC 2005).

Archaeological Potential
Apart from the isolated complexes found at Austerfield Quarry there is little evidence of past activity in this part of the landscape on the basis of cropmarks. A Bronze Age palstave and Roman pottery were recovered to the south-east of the quarry (N HER PRN, 5074; N HER PRN, 5074a).

Archaeological Investigation
A single watching brief has been undertaken at Newington 2 Quarry in advance of extraction, although no archaeology was encountered (TPAT 1994b; Ref. No. 318).

Impact Assessment of Future Extraction
The archaeological potential for this quarry is considered to be low as no cropmarks exist in the immediate vicinity and no archaeology has been recovered from the work carried out at the quarry or in the close vicinity. Newington 2 Quarry lies within a general Area of Search (NCC 2005).

37. Styrrup Quarry (Styrrup with Oldcotes; SK 6050 9024; Fig. 7.22)
*Status***:** Active Sandstone
Solid Geology: Sherwood Sandstone
Drift Geology: N/A
Soil: 551b Cuckney Series

Extraction History
Extraction commenced in the 1940s and continued under several old permissions (W. Allum pers. comm.). These were consolidated in 1999 with permission to extract sand and gravel until 2016 (Webster 2004). Dri-lime Mortar Limited took over in the 1970s, but has since been owned by J.D.E. White and Company (W. Allum pers. comm.). Several former quarry workings are depicted on the first edition Ordnance Survey map in the vicinity of the present quarry mainly to the west (OS 1890; OS 1891).

Archaeological Potential

No cropmarks exist in the immediate vicinity of this quarry, although linear and rectilinear features are present to the west, north and east within a radius of 1.4km, indicating a wider agricultural landscape. A hoard of 600 Roman coins and a sherd of Roman pottery were found in a field in 1885 to the west of the quarry (N HER PRN, 5070), along with prehistoric finds (N HER PRN, 5585).

Archaeological Investigation

No archaeological investigations have been undertaken in advance of extraction. A geophysical survey, fieldwalking exercise and excavation were undertaken approximately 1km to the north of the quarry, but no archaeology was encountered (Badcock and Symonds 1994a; Ref. Nos 1, 300 and 600). The fieldwalking yielded four pieces of flint of probable Mesolithic date and a single sherd of Roman pottery.

Impact Assessment of Future Extraction

The archaeological potential of Styrrup Quarry is low with no known archaeology in the immediate vicinity. There are no plans in place to carry out any future mineral extraction at Styrrup Quarry (NCC 2005).

38. Serlby Sand Quarry (Styrrup with Oldcotes; SK 6292 9038; Fig. 7.23)
Status: Active Sand and Gravel
Solid Geology: Sherwood Sandstone
Drift Geology: Till
Soil: 551b Cuckney Series, 541f Rivington Series

Extraction History

Extraction began is the late 1920s by the Serlby Sand Company. It was taken over in the 1990s by Caird Environmental and by Shanks McEwan in 1999. The Waste Recycling Group took over in 2004 (W. Allum pers. comm.).

Archaeological Potential

Serlby Sand Quarry lies within a rich cropmark landscape comprising trackways and rectilinear enclosures and land divisions. Indeed, traces of a trackway and field system run in an east-west direction through the northern part of the quarry indicating an agricultural regime typical of the brickwork plan dating to the Iron Age/Roman period. A former quarry to the north of the existing extraction area also interrupts part of this field system. A Roman coin of Antoninus Pius (AD 145-161) was found just to the north of the quarry (N HER PRN, 5060).

Archaeological Investigation

No archaeological investigations have been carried out in advance of extraction. Significantly, a watching brief undertaken 600m to the west within a rectilinear cropmark complex has produced no signs of the expected ditches (TPAT 1992; Ref. No. 302). It is probable that much of this cropmark landscape is now so badly degraded that its archaeological potential can no longer be realised.

Impact Assessment of Future Extraction

The archaeological potential at Serlby Sand Quarry is theoretically high and any future extraction should include an archaeological mitigation strategy in order to investigate the substantial cropmark data.

39. Scrooby North Quarry (Scrooby; SK 6554 9008; Fig. 7.24)

Status: Active Sand and Gravel

Solid Geology: Sherwood Sandstone

Drift Geology: Alluvium, River Terrace Deposits

Soil: 551b Cuckney Series

Extraction History

Extraction commenced in 1973 by the Rotherham Sand and Gravel Company Limited (W. Allum pers. comm.).

Archaeological Potential

Intermittent cropmarks, 400m to the north of the quarry, represent a medieval moated site, whilst regular rectilinear cropmarks of probable Iron Age/Roman date are depicted to the north-west. Several finds have also been recovered in the vicinity including a Bronze Age find (N HER PRN, 5065) to the north.

Archaeological Investigation

Several excavations have been undertaken in association with quarry extraction, although most of these have been carried out on the southern part of the quarry, which lies outside the study area. One watching brief has been undertaken within the study area, which produced evidence in the form of Bronze Age artefacts and a Roman ditch (Stead 2000; Ref. No. 321). Archaeological investigations on the southern extension of the quarry have revealed further evidence for Roman activity (ARCUS 1996c; ARCUS 1996d; ARCUS 1999b). Excavations to the north of the quarry in the vicinity of the medieval cropmarks have yielded no archaeology (Stratascan 1994a; Ref. No. 3; TPAT 1994c; Ref. No. 324; APS 2005; Ref. No. 326; TPAT 1991; Ref. No. 317; TSAC 2005; Ref. No. 325).

Impact Assessment of Future Extraction

The archaeological potential in the immediate vicinity of the quarry is moderate because, although there is a lack of cropmarks, prehistoric and Roman archaeology has been recovered from excavations (Stead 2000). Planning permission exists to the east of the railway line for further extraction (NCC 2005). It is recommended that any future extraction has an appropriate archaeological mitigation strategy.

40. Mattersey Quarry (Mattersey; SK 6610 9060; Fig. 7.24)

Status: Inactive Sand and Gravel

Solid Geology: Sherwood Sandstone

Drift Geology: River Terrace Deposits, Peat

Soil: 551b Cuckney Series, 1022b Altcar Series

Extraction History

Mattersey Quarry was controlled by Lafarge Aggregates Limited until the 1960s. A northern extension, which lies in the study area, is now owned by Rotherham Sand and Gravel Limited (W. Allum pers. comm.). Whilst there is a designated area for sand and gravel extraction, this has not yet commenced.

Archaeological Potential

Linear features of uncertain date are depicted to the east of the quarry. A Neolithic flint arrowhead (N HER PRN, 5572) and a Roman finds scatter (N HER PRN, 5571) were recovered to the east of the quarry.

Archaeological Investigation

No archaeological investigations have been undertaken in advance of extraction. Several archaeological investigations have been carried out to the north of Scrooby North Quarry, as detailed above.

Impact Assessment of Future Extraction

The archaeological potential in the immediate vicinity of the quarry is low due to the lack of cropmarks. Despite this, the wider landscape is considered to have moderate potential with known prehistoric, Roman and medieval archaeology.

Quarry Landscapes Study Areas

41. The Micklefield Area

Newthorpe Quarry (Huddleston with Newthorpe; SE 4600 3220; Fig. 7.25)
Status: Active Magnesian Limestone
Solid Geology: Cadeby Formation
Drift Geology: N/A
Soil: 511a Aberford Series

Peckfield Quarry (Sturton Grange; SE 4400 3220; Fig. 7.25)
Status: Active Magnesian Limestone
Solid Geology: Cadeby Formation
Drift Geology: N/A
Soil: 511a Aberford Series

Extraction History

The land at Newthorpe Quarry is currently owned by Crockey Hill Properties and is rented by Darrington Quarries Limited (B. Binstead pers. comm.). Extraction was established prior to planning control regulations in 1947 (A. Shaw pers. comm.), although quarrying has occurred here since at least the medieval period. Indeed, Magnesian Limestone was supplied from quarries at Huddleston and Stapleton to build Eton College in 1442 (Parsons 1990, 9). It is also known that the quarries in Huddleston were owned by the Langton family in the later middle ages (Parsons 1990, 12). Peckfield Quarry was established in 1978 by the National Coal Board (M. Rathmell pers. comm.), but it is now owned by Bardon Aggregates (Cameron *et al.* 2005). Several limestone quarries are depicted on the first edition Ordnance Survey map surrounding both the quarries including one within the current extraction area at Newthorpe Quarry highlighting the antiquity of extraction here (OS 1850a; OS 1850b).

Archaeological Potential

These quarries lie either side of the A1 corridor in a mixed cropmark landscape that contained rectilinear strip fields with field corner enclosures, as well as more irregular mixed field systems and double ditched trackways. The most notable cropmark complex is that located immediately to the west of Newthorpe Quarry. This complex linear grouping of sub-rectangular and sub-circular enclosures seems to lie on either side of a spinal east-west trackway. The complex is clearly the product of more than one phase of activity and internal features within the enclosures support the notion that it may have functioned as a settlement. Newthorpe Quarry has curtailed the eastern extent of this cropmark group, whilst to the west the continuation of the complex has been identified as preserved earthworks in Castle Hills Wood (see below).

Rectilinear cropmarks, which clearly form part of a wider agricultural regime within the current extraction area at Peckfield Quarry, were present at the time of photography in 1972, although these may well now have now been quarried away. To the south of the quarry is a series of north-south orientated strip fields with field corner enclosures, flanked by more irregular field patterns to the west and east. The Castleford to York Roman road (Roman Ridge, 28b) is located just 0.5km to the west of Peckfield Quarry (Margary 1973).

Several Neolithic flints were recovered 2km to the north of the quarries during a fieldwalking exercise (WY HER; Ref. No. 8024) and a beehive quern has been found at Newthorpe Quarry (Wheater 1882, 6). A Roman coin dating to the 4th century has also been found to the south-west of Peckfield Quarry, along with a 7th-century brooch (WY HER, PRN: 2306).

Archaeological Investigation

The earliest archaeological intervention close to these quarries was a watching brief at Highfield Lane, Micklefield, *c.* 150m to the south of the linear enclosure complex (O'Neill 1997a; Ref. No. 4051). This revealed linear ditches that corresponded to cropmarks suggestive of an Iron Age/Roman period agricultural landscape. No dating evidence was recovered during the watching brief.

A topographical and geophysical survey was undertaken on earthworks in Castle Hills Wood to the west of Newthorpe Quarry as part of a wider environmental investigation funded by Leeds City Council (McNaught 1998a). The earthworks are part of a designated Scheduled Ancient Monument (WY31531) and lie in a Site of Ecological and Geological Importance within an Ancient Woodland Site (McNaught 1998a). The geophysical survey results in the field to the east of Castle Hills Wood revealed the same pattern of multi-phased enclosures either side of a central trackway as indicated by the cropmark data. The earthwork survey in the woodland to the west revealed parts of the complex to be preserved as extant earthworks, whilst the trackway manifests itself as a sunken way or 'hollow-way'. (McNaught 1998b; Ref. No. 2035). A further topographical and geophysical survey was carried out at Castle Hills to the west of Newthorpe Quarry in advance of the A1 Darrington to Dishforth road scheme (Whittingham and McNaught 2001; Ref. No. 2044). Neither of these investigations has led to any further work nor were they carried out in advance of quarrying.

More recent geophysical survey has been carried out in advance of the A1 (M) road scheme at various locations to the south of Newthorpe Quarry, generally revealing linear anomalies, consistent with the cropmark data (GSB 1992; Ref. No. 2065). Four excavations were subsequently carried out between the two quarries (referenced FHM/C4SA/03, FHM/M/03, FHM/R/03 and FHM/J/03), although one (FHM/J/03) did not yield any archaeology (Brown *et al.* Forthcoming; Ref. No. 5133). The northernmost excavation (FHM/C4SA/03) lay 600m to the east of Peckfield Quarry and has yielded evidence of later Iron Age and Roman activity including a

high status settlement within a group of field corner enclosures and a Roman burial. Radiocarbon dating at the site indicates a date range for occupation of cal. AD 20-130 (Brown *et al.* forthcoming). Only 0.2km to the south of this, another investigation (FHM/R/03) found enclosure ditches and part of a pit alignment. These were dated to the Iron Age/Roman period based on pottery finds (Brown *et al.* forthcoming).

Most significant however are the findings made only 0.4km to the south-west of Newthorpe Quarry, and just 0.3km south of the complex enclosure group (above). The site here (FHM/M/03) revealed part of a rectilinear enclosure system that was only partly represented in the cropmark record. Excavation revealed a complete roundhouse as well as hundreds of discrete pits. These may have been for food storage but some had definitely been used for ritual purposes, a number containing human skeletal remains, whilst others received animal burials. The site would appear to be of later Iron Age date and radiocarbon dates have been obtained in the range 520 cal. BC-90 cal. BC. The finds included Iron Age pottery, along with brooches and bangles in some of the graves. The presence of Roman pottery suggests continuity after the Roman conquest (Brown *et al.* forthcoming).

Further geophysical survey work to the north revealed linear anomalies (ASUD 2001; Ref. No. 2034), which were subject to evaluation (Site FHM/N/03; Brown *et al.* forthcoming)

The only archaeological work carried out in relation to mineral extraction at either of the quarries was carried out at the western edge of Newthorpe Quarry following an extension to the workings in 2000. This revealed a number of potential features, one of which might be equated with an enclosure ditch plotted as a cropmark and geophysical anomaly at the linear enclosure complex there. Although no diagnostic artefacts were recovered from this ditch a radiocarbon date on a cattle bone from the upper ditch fill (40 cal. BC – cal. AD 130) suggests there was Late Iron Age or Romano-British activity in this part of the complex (Signorelli and Roberts 2006; Ref. No. 4065).

Impact Assessment of Future Extraction

Newthorpe Quarry lies within a general Area of Search that exists for North Yorkshire (NYCC 1997). A planning application has been submitted by Darrington Quarries Limited for a southern extension to Newthorpe Quarry (B. Binstead pers. comm.), the western part of which will impact on a complete sub-rectangular enclosure. Peckfield Quarry has a Safeguarding Area to the south of the existing quarry (LCC 2001), where a series of rectilinear fields and sub-enclosures cropmarks are known. The archaeological potential in this landscape is high and the expansion of either quarry in any direction is likely to have an archaeological impact. Perhaps the greatest potential lies to the west of Newthorpe Quarry, given the rarity and lack of understanding of the linear village-type concentration of enclosures found there.

42. The Methley Gravels

Methley Quarry (Methley; SE 4120 2680; Fig. 7.26)

Status: Active Sand and Gravel

Solid Geology: Middle Coal Measures

Drift Geology: River Terrace Deposits, Alluvium

Soil: 811b Conway Series, 541r Wick Series

Extraction History

Redland Aggregates Limited gained permission to extract sand and gravel here in 1976. Since 1997 the quarry has been operated by Lafarge Aggregates Limited (M. Rathmell pers. comm.). Extraction began in the vicinity of Willow Grove Farm, to the east of Boat Lane, and extended first north-eastwards towards the River Aire, and then north-westwards to the west side of Boat Lane, to exploit areas to the west of Boat Lane around Parlour Pit Wood, north of Lower Mickletown.

Archaeological Potential

The cropmarks of the Aire-Calder interfluve were first mapped in detail by Deegan (1999) to reveal an extensive network of seemingly contemporary field systems linked by trackways surrounding Methley. The wider results also revealed a number of ring ditches which may represent early prehistoric ritual monuments. To the west of the quarry are cropmarks of co-axial strip fields focused upon a double-ditched trackway, but in the vicinity of the quarry the cropmarks are less regular in plan displaying perhaps a more organic evolution. The cropmarks in the quarry area are also more fragmentary and geophysical survey has been used to good complementary effect to fill in gaps in the record. Whilst this agricultural landscape probably dates to the later Iron Age/Roman period, finds (mainly flints; WY HER) attest earlier prehistoric activity as well.

Archaeological Investigation

Many archaeological interventions have taken place in and around Methley Quarry, the earliest, including geophysics, excavations and fieldwalking targeted upon cropmark sites, being carried out in the late 1970s and 1980s (Marriott and Yarwood 1992; Marriott and Yarwood 1986, 43; Yarwood and Marriott 1988a). The earliest reported investigation was a geophysical survey at Park Lane in 1985, 2.3km to the west of the present quarry (Marriott and Yarwood 1992, Ref. No.: 2031). The results of this survey tie in with the cropmark data and show a ring ditch, linear ditches, trackways and several discrete anomalies, which probably represent pits. A further geophysical survey was undertaken in 1989 to augment this data (Yarwood and Marriott 1989a, 18). Fieldwalking carried out in 1991 yielded fifteen flints, two of which could be dated to the Bronze Age (Marriott and Yarwood 1992; Ref. No. 8001).

A rescue excavation was undertaken in 1988 in advance of extraction near Willow Grove Farm. This recorded several ditches of a rectilinear field/enclosure system, a curvilinear enclosure, and

finds of Iron Age pottery and a beehive quern (Yarwood and Marriott 1988a, 27; Ref. No. 5097). Pits were also uncovered, some of which contained evidence of metalworking. Finds from fieldwalking include Mesolithic, Neolithic and Bronze Age flints, a 4th-century AD bone pin and a lead loomweight (Marriott and Yarwood 1986, 43).

A further geophysical survey was carried out at Dunford House, 200m to the south-west of the current quarry limits, in advance of sand and gravel extraction by Redland Aggregates Limited (Yarwood and Marriott 1988b, 27; Ref. No. 2068). The survey supplemented the cropmark data to reveal further ditches and a rectilinear enclosure with associated pits (Yarwood and Marriott 1988b, 27). This survey has only been reported on briefly in the Council for British Archaeology (CBA) newsletter without any plans and is therefore not available on the GIS programme. A further geophysical survey was carried out at Thorpe Close in 1989, adjacent to the survey undertaken at Dunford House (Yarwood and Marriott 1989b, 18; Ref. No. 2072), revealing a continuation of the field system, along with a small sub-circular enclosure, also known from cropmark data (Yarwood and Marriott 1989b).

In 1990 a north-eastern extension to the quarry prompted a geophysical survey and trial trenching evaluation leading ultimately to a series of open area excavations. The area was suspected of being one of settlement from the finds of samian ware and Roman cooking pots with sooting, all of which suggested a date of 1st to 2nd-century AD. The geophysical surveys revealed elements of a rectilinear field system with field corner enclosures, within which was a more irregular curvilinear enclosure element and a number of ring ditches, which appeared to be earlier (Yarwood and Marriott 1990; Ref. Nos 2076 and 5140; 1991; Ref. No. 2062; Boucher and Webb 1996). Following trial trenching (Wright 1994; Ref. No. 5046) an excavation was undertaken within a small field corner enclosure which revealed evidence for several phases and small-scale iron smithing (Burgess forthcoming; Ref. No. 5048/5131).

Further investigations of the larger enclosure complex at Boat Lane, 100m to the north-east, revealed numerous ditches, sub-circular structures and pits, along with several multi-phased enclosures (MAP 1996a; Ref. No. 2074; MAP 1996b; Ref. No. 5051; MAP 1997b; Ref. No. 5052). Archaeomagnetic dating of a fired pit provided a date between 100 BC-50 AD (MAP 1996a).

In 1996 Miller Mining commissioned a desk-based assessment and a geophysical survey in advance of opencast mining at Parlour Pit, to the west of Boat Lane. In an area relatively devoid of cropmark data, the geophysical survey results revealed further enclosures and field boundaries forming both rectilinear and irregular shaped fields (Boucher and Webb 1996; Ref. No. 2016). Additional excavations in 1998 confirmed a multi-phased enclosed field system, along with pits and structural features dating from the Iron Age/Romano-British periods (MAP 1999a). More of this agricultural landscape was uncovered in 1999 (MAP 1999b). Investigations have also identified a circular ring ditch relating to World War Two activity (MAP 1997b).

In 1999 further proposed extensions to the quarry by H.J. Banks and Company Limited saw another desk-based assessment and mitigation strategy prepared (Keith 1999). The following geophysical survey (Webb 2000b; Ref. No. 2042) complemented previous surveys (Boucher and Webb 1996; Yarwood and Marriott 1991; Ref. No. 2062) in extending the mapping of an ancient enclosed field system in the absence of good cropmark data. A subsequent desk-based assessment and mitigation strategy document was prepared for the same area for Lafarge Aggregates in 2001. This detailed the requirements for fieldwalking and trial trenching in the light of the previous geophysical survey results, with the possibility of open area excavation as a final mitigation proposal (Keith and Roberts 2001). Consequently, a series of excavations were carried out by MAP from 2002. The first of these identified prehistoric features, mainly pits and linear features, which contained flints and pottery. The pottery assemblage included Neolithic Peterborough Ware (MAP 2002c), though further work revealed only a post-medieval field boundary, modern and undated features (MAP 2002d). The final excavation phase uncovered ditches and pits, but dating was confined to a single sherd of Romano-British pottery from one of the ditches (MAP 2003c).

A fieldwalking and trial trenching exercise carried out to the north of Lower Mickletown in 2003 confirmed the existence of ditches previously located by geophysical survey and also identified additional discrete features, such as pits, post-holes and hearths (Mc Cluskey and Roberts 2003; Ref. No. 5005). The fieldwalking produced few artefacts, including some prehistoric flints and medieval pottery. In 2005 a desk-based assessment was carried out prior to a further extension (Phase 10), which is likely to lead to further archaeological work in advance of extraction (Newton 2005).

In the wider landscape around Methley, several archaeological interventions have been undertaken to the west of the quarry. These include those at Methley Primary School in which enclosures of probable prehistoric/Roman date and medieval ridge and furrow were uncovered, along with post-medieval activity (OSA 2003b; OSA 2004; Ref. Nos 5057 and 5059). Further to the west, at Mickletown Road, a geophysical survey, watching brief and evaluation were carried out uncovering evidence of a series of ditches of uncertain date (Stratascan 1999; AOC 2000a; AOC 2000b; Ref. Nos 2058, 5053 and 5054). To the north of this, geophysics and excavation have revealed an early prehistoric and Iron Age settlement that continued into the Roman period (Boucher 1992; Barkle 1995; Ref. Nos 2061 and 5136).

Impact Assessment of Future Extraction

An application for a further extension to Methley Quarry was submitted to Leeds County Council Planning Department in 2006 (C. Saul pers. comm.). It is apparent that despite poor cropmark formation in parts of the gravel terrace, this area has high potential for archaeological features relating to settlement and land division of the later Iron Age and Roman periods. Moreover, there is a strong likelihood of the presence of evidence for earlier prehistoric activity along the terrace

edge, which may only be detected through the recovery of artefacts through fieldwalking or by open area excavation.

43. The Kirk Smeaton Area

Barnsdale Bar Quarry (Kirk Smeaton; SE 5134 1464; Fig. 7.27)
Status: Active Magnesian Limestone
Solid Geology: Cadeby Formation, Edlington Formation
Drift Geology: Head
Soil: 511a Aberford Series

Long Lane Quarry (Norton; SE 5167 1512; Fig. 7.27)
Status: Active Magnesian Limestone
Solid Geology: Cadeby Formation, Edlington Formation
Drift Geology: Head
Soil: 511a Aberford Series

Extraction History

The first recorded mineral permission at Barnsdale Bar Quarry was recorded in 1949 (HR 30) with subsequent permissions between 1960 and 1990. Drinkwater Sabey commenced extraction at Barnsdale Bar in the 1980s. In 1995 the quarry was taken over by BFI Waste Systems and was subsequently acquired by SITA Products and Services Limited in 1998 (SITA 1999). Darrington Quarries Limited, who bought the plant in 2001, had already owned the quarry at Long Lane since the 1980s (B. Binstead pers. comm.; Cameron *et al.* 2005). Multiple limestone and sandstone quarries are shown on the first edition Ordnance Survey map (OS 1854a) showing extensive small-scale extraction in this area in the 19th century, if not earlier.

Archaeological Potential

Both these quarries lie within an extensive cropmark landscape, although in the area of the quarry itself the cropmarks are rather intermittent. The surrounding landscape, however, contains large areas of former strip fields, often subdivided and with field corner enclosures. There are many double-ditched trackways with appended enclosures as well as discrete enclosures of sub-rectangular and irregular plan. The majority of the cropmarks appear to have coexisted at one time, although in a few instances the cropmarks are superimposed, so indicating more than one phase of land division. A few detached circular cropmarks suggest an early prehistoric ritual element in the landscape. Early prehistoric activity is also reflected in the finds recovered from fieldwalking, which has yielded flints dating to the Neolithic period (Webb 1995b; Ref. No. 7001). Notably, a Bronze Age contracted skeleton was found 2km to the north of the quarries (NMR_NATINV-56060). An Iron Age beehive quern has been found 2km to the north-east, along with Roman finds of a bronze brooch (Doncaster Museum) and a coin (SWYOR-BF39F6). The Castleford to York

Roman road (Roman Ridge; 28b) runs in a north-west/south-east direction just 300m to the west of the quarry (Margary 1973).

Archaeological Investigation

Numerous archaeological investigations have been carried out in association with Magnesian Limestone at Barnsdale Bar Quarry, which straddles the border between North and South Yorkshire.

North Yorkshire

The earliest archaeological work carried out at Barnsdale Bar Quarry was a geophysical survey, which detected part of an ancient field system (Abramson 1989a; Ref. No. 1009) and led to a trial-trenching evaluation which revealed ditches and a crouched inhumation (Abramson 1989b; Ref. No. 4005). Further extraction was preceded by a further geophysical survey, which detected a continuation of the field system (Abramson 1990; Ref. No. 1008). In light of the results, North Yorkshire Heritage Unit recommended an additional excavation, which was subsequently carried out by the East Riding Archaeological Research Committee (Simpson 1990; Ref. No. 4062). This intervention revealed enclosure ditches and entrances suggestive of agricultural activity. A possible hearth and an isolated burial were thought to indicate settlement in the vicinity. Based on the pottery, the site was dated to the Roman period.

Agreed mitigation for a proposed western extension of the quarry in 1992 was a geophysical survey in the first instance. The results provided further evidence of former land division (Webb 1993a; Ref. No. 1000) and subsequent excavation work uncovered a further burial and a number of ditches (Webb 1993b; Ref. No. 4061). This area was subjected to a watching brief in 1997 which recorded and sampled several ditches, recovering Late Iron Age and Roman pottery and more skeletal remains (Brown and Morris 1997; Ref. No. 4000).

The established procedure of geophysical survey followed by trial trenching was carried out in advance of an extraction south-westwards. The geophysical survey results detected linear and curvilinear anomalies, whilst an additional fieldwalking exercise produced a significant spread of flints (Webb 1995b; Ref. No. 1002). The trial excavations provided a further sample of the former linear ditches which were interpreted as field boundaries rather than those of a settlement (Speed 1997a; Ref. No. 4002).

In 1995 BFI Waste Systems submitted an application for an extension to the north-west of the quarry. This was preceded by a geophysical survey in which a probable trackway was identified (Webb 1996b; Ref. No. 1004). No further mitigation was recommended despite the detection of a trackway.

An application for an eastern extension was submitted in 1995 and a desk-based assessment was required by the North Yorkshire Heritage Unit in the first instance. The report highlighted the previous success of geophysical survey in this area, which was subsequently incorporated in the evaluation strategy, along with a programme of fieldwalking and trial trenching (Boucher 1996a). The geophysical survey detected several linear field boundaries, as well as a field corner enclosure and two small detached enclosures (Cottrell 1996; Ref. No. 1003). Trial trenching confirmed the legitimacy of the geophysical anomalies (O'Neill 1999; Ref. No. 4030) and the whole site was subject to investigation by Strip and Record in advance of each phase of extraction. Archaeological Strip and Record and follow-up excavations were carried out in 2003, 2004 and 2006 by Archaeological Services WYAS. These have revealed evidence for further ditches and pits suggesting agricultural and settlement activity dating to the Later Iron Age/Roman period. Two small discrete enclosures have been fully excavated but do not appear to have functioned as settlements and were probably used for corralling livestock. The most recent work has produced a single human burial in one of the field ditches. No report has been produced yet for these interventions.

Archaeological investigations at Long Lane Quarry in North Yorkshire began in 1997. A geophysical survey identified a number of linear and discrete anomalies which suggest an enclosure and pits (Webb 1997b; Ref. No. 1005). Based on these results, a trial trenching strategy was required by the North Yorkshire Heritage Unit. This identified three phases of settlement activity dating from the Iron Age to the Roman period, as indicated by the pottery (O'Neill 1997b; Ref. No. 4001).

South Yorkshire

By 1999 SITA Products and Services Limited submitted an application for a southern extension to the western part of Barnsdale Bar Quarry. A geophysical survey was required by South Yorkshire Archaeology Service (SYAS), which detected linear anomalies (Webb 2000c; Ref. No. 3024). An evaluation, involving test-pitting to investigate the continuation of a flint scatter found to the north, and an open-area excavation were required by SYAS and carried out by Archaeological Services WYAS in 2000. The test-pitting did not reveal significant numbers of flint and the excavation confirmed the positions of the linear ditches of the rectilinear field system, which had been very truncated by modern agricultural methods. The field system could be no better dated than 2nd to 4th centuries AD based on the recovered artefacts, principally pottery (Burgess 2000; Ref. No. 6002; Burgess 2001a; Ref. No. 6000).

A desk-based appraisal and mitigation proposal were recommended by SYAS in consideration of a further southern extension as far as the Barnsdale Bar roundabout (Roberts 2003b). A geophysical survey (Webb 2003; Ref. No. 3033) and subsequent evaluation exposed linear ditches and enclosures (Gidman 2004; Ref. No. 6001). The resultant open-area excavation revealed very truncated field ditches of later Iron Age/Roman date. More significant, however, was a small group

of pits which variously contained burnt bone, hazelnut shells and charcoal, radiocarbon dated to the early Neolithic, a date supported by lithic finds (Gidman and Roberts 2005; Ref. No. 6104).

Two geophysical surveys have been carried out to the south-west of the quarries in advance of the A1 (M) and Hemsworth Bypass road schemes. Linear anomalies were detected, some of which align with cropmarks in the area (Stratascan 1994b; Webb 2005a; Ref. Nos 1019 and 2053). More significant were the results achieved at Scorcher Hills Lane 2.3km to the south, on the site for a proposed new quarry by Darrington Quarries Limited. The landscape here is virtually devoid of cropmarks and fieldwalking was very unproductive. Yet geophysical survey results revealed a rectilinear field system, complete with ditched trackways and field corner enclosures. Two potential circular features, one of which did show up in the cropmark record, suggest early prehistoric funerary monuments (Rose and Webb 2004). The site has not progressed to extraction.

Impact Assessment of Future Extraction

Barnsdale Bar Quarry has a designated Buffer Zone to restrict development to the east (Skinner 1998) and has planning permission to extract further aggregates to the south (B. Binstead pers. comm.). A planning application has recently been submitted to North Yorkshire County Council for a northern extension (Gresty 2006b), which encompasses a known cropmark enclosure. The Barnsdale Bar landscape contains extensive field systems and enclosures of different types and their continued investigation can provide the opportunity to understand the chronology and function of them, although in many areas it is apparent that this resource is becoming heavily degraded through modern agricultural techniques. Moreover, the landscape repeatedly reveals evidence of early prehistoric activity which remains little understood.

44. The Hampole Area

Hazel Lane Quarry (Hampole; SE 5000 1090; Fig. 7.28)
Status: Active Magnesian Limestone and Clay and Shale
Solid Geology: Cadeby Formation, Edlington Formation, Brotherton Formation
Drift Geology: Alluvium
Soil: 511a Aberford Series, 713a Bardsey Series

Skelbrooke Quarry (Hampole; SE 5104 1130; Fig. 7.28)
Status: Inactive Magnesian Limestone
Solid Geology: Brotherton Formation, Cadeby Formation, Edlington Formation
Drift Geology: Alluvium, Till
Soil: 511a Aberford Series

Extraction History

The first planning permission for Hazel Lane Quarry was granted in 1960 by the West Riding County Council (DC 4174), followed by a further six applications (The Land and Development Practice 1999). Hazel Lane Quarry is currently operated by Cat Plant (Cameron *et al.* 2005).

The first planning permission at Skelbrooke Quarry was granted before 1950 with two subsequent applications in 1990 and 1996 by Darrington Quarries Limited, who have operated at the quarry since the late 1960s/early 1970s to 2001 (B. Binstead pers. comm.). Several limestone quarries are depicted on the first edition Ordnance Survey map (OS 1854a) indicating the antiquity of quarrying in this area. Indeed, documentary sources suggest that quarrying was undertaken in the Hampole area since at least the 16th century (Salzman 1952, 132).

Archaeological Potential

There are very few cropmarks in the immediate vicinity of the quarries, although the wider landscape contains a mixed pattern of cropmarks that includes rectilinear enclosures, land divisions and trackways of probable later Iron Age/Roman date. In the close vicinity of the quarries the cropmarks are fragmentary, though small sub-rectangular enclosures and intermittent field boundaries are recorded at Hazel Lane Quarry and the area immediately to the north.

There are few cropmarks in the vicinity of Skelbrooke Quarry, although a notable double-ditched enclosure lies just 200m to the north-west of it, between the two quarries, and intermittent elements of a rectilinear field system are recorded 350m to the east of it. Also lying to the east of Skelbrooke Quarry are the cropmarks of the Roman fort site at Burghwallis which lies on the Roman road between Castleford and York (28b; Margary 1973). The Roman road actually skirts the eastern edge of Skelbrooke Quarry, providing the site with some circumstantial potential for Roman activity.

Roman coins, pottery, and a bronze pin have been found 500m to the north-east of Skelbrooke Quarry (Doncaster Museum; Thorp 1974, 144), whilst a Roman bronze fastener has been recovered 650m to the south-east of it (Doncaster Museum). Roman coins and pottery have also been found 850m to the north of Hazel Lane Quarry (WY HER, PRN: 6850).

Archaeological Investigation

A number of archaeological investigations have been carried out in advance of limestone extraction at Hazel Lane Quarry, though comparatively little has taken place at Skelbrooke Quarry.

Hazel Lane Quarry

Following an initial desk-based assessment (Cumberpatch 1993), two geophysical surveys were undertaken to what was then the north of the quarry, revealing a ditched enclosure with internal divisions (Noel and Lambert 1994a; Ref. No. 3011; Noel and Lambert 1994b; Ref. No. 3012). Subsequent trial excavations could not ascertain the date and function of the enclosure (Hale and Noel 1994; Ref. No. 6023) and consequently a full open area excavation was carried out. This work revealed a sub-rectangular enclosure with diagonally-opposed internal, corner sub-enclosures that effectively divided the interior into four. The enclosure has been dated to the 1st to 2nd centuries AD on the basis of recovered pottery, and it has been suggested that it performed a stock control function due to the lack of evidence for domestic or industrial activity (Brown 1997; Ref. No. 6009).

A further northern extension to the quarry saw a further archaeological assessment carried out as part of a wider environmental impact assessment (Sidebottom 1999). A subsequent geophysical survey detected numerous anomalies that were interpreted as archaeological enclosures and land divisions, whilst a number of discrete anomalies were viewed as possibly indicative of settlement activity (Webb and Whittingham 2001b; Ref. No. 3028) which was supported to a degree by a fieldwalking exercise which yielded prehistoric flints, Roman and medieval pottery as well as a range of post-medieval finds (ARCUS 2001a; Ref. No. 9005). Trial trenching of the enclosure ditches and some of the pits tended to confirm a domestic/agricultural function (ARCUS 2001b; Ref. No. 6063), probably of Roman date, though this assertion is based upon the perceived relationship with the enclosure to the previously investigated features in the area. Open-area excavation revealed further pits containing charcoal, shells and copper alloy and confirmed the site's Late Iron Age/Romano-British date (ARCUS 2001c; Ref. No. 6070).

Geophysics to the west of the above earlier archaeological interventions detected evidence of more rectilinear anomalies (GeoQuest Associates 2002; Ref. No. 3013). Evaluation revealed features of Roman date, including ditches, gullies, and a hearth dating to the 3rd/4th centuries AD (TVAS 2002; Ref. No. 6071). A subsequent excavation revealed a Roman building that contained at least four rooms, several floor surfaces, hearths and finds of painted plaster and hypocaust tiles (Price

2002; Ref. No. 6072), typical of a Roman bath-house and indicative of a villa in the immediate vicinity.

The most recent work has seen a geophysical survey and trial trench evaluation of an enclosed field system. As well as part of a pit alignment this work has revealed a D-shaped enclosure that appears to predate the trackway, gullies and pits, some of which are dated to the Roman period on the basis of the pottery recovered (Roseveare and Roseveare 2003; Ref. No. 3078; Taylor 2003; Ref. No. 6167).

Skelbrooke Quarry

Only medieval and post-medieval agricultural evidence has been identified by a geophysical survey and excavation at Skelbrooke Quarry (Nicholls and Webb 1996; Ref. No. 3018; Speed 1996; Ref. No. 6033). A further evaluation undertaken in 1997 proved negative (Speed 1997b; Ref. No. 6119).

South Elmsall

The archaeological potential of the surrounding landscape has been realised to the north by the work at Barnsdale Bar (above). This is further illustrated by the findings from a series of excavations in the landscape at South Elmsall, just 1km to the north-west. Here a series of investigations have utilised both geophysical survey (McNaught 1997; Webb 1998c; Ref. Nos 2024 and 2032) and trial trenching to locate and investigate settlement and industrial focal points within a rectilinear Late Iron Age/Romano-British field system. Most significant has been the discovery of Late Bronze Age/Early Iron Age settlements, one unenclosed and the other within a palisade enclosure, neither of which could be detected by aerial reconnaissance or geophysical survey (O'Neill 1997c; O'Neill 1998b; McNaught 1998c; Howell, 1998; Ref. Nos 5079, 5080, 5081 and 5082; Wheelhouse 1996; Burgess 1998; Ref. Nos 5077 and 5078).

Impact Assessment of Future Extraction

Both Hazel Lane Quarry and Skelbrooke Quarry have designated Preferred Areas to the north (Skinner 1998), most of which has now been quarried away following archaeological interventions. A Buffer Zone exists around both the quarries in order to protect them from any non-aggregate development (Skinner 1998). On the face of it the archaeological potential of the Buffer Zone based on cropmarks is only moderate. The evidence to date from Hazel Lane Quarry, however, has shown that the cropmarks in this area considerably under-represent the archaeology. This fact is demonstrated repeatedly at a number of other sites within a 2km radius, such as Barnsdale Bar Quarry to the north, Scorcher Hills Lane to the north-east, South Elmsall to the north-west and Adwick-le-Street to the south-east (below). Overall, given the relative lack of findings so far at Skelbrooke Quarry, the archaeological potential of the area might be regarded as high to moderate.

45. Adwick-le-Street

Brodsworth Quarry (Pickburn Leys) (Brodsworth; SE 5250 0710; Fig. 7.29)

Status: Inactive Magnesian Limestone

Solid Geology: Brotherton Formation, Edlington Formation, Cadeby Formation

Drift Geology: N/A

Soil: 511a Aberford Series, 713g Brickfield Series

Extraction History

Several planning permissions have been granted since 1970. A number of limestone quarries are depicted on the first edition Ordnance Survey map (OS 1854b), which indicate the antiquity of quarrying in the area. The quarry was owned by Tarmac Limited, but was last operated by Mineral Investments in the 1980s (D. Cameron pers. comm.).

Archaeological Potential

The cropmark record within the quarry area itself is sparse, consisting only of an east-west ditch, part of a north-south trackway and a small enclosure, none of which was archaeologically investigated. It is likely that these fragmentary cropmarks are part of the more coherent cropmark regime preserved within the eastern part of the present quarry Buffer Zone. These take the form of east-west rectilinear strip fields with subdivisions and small integrated enclosures. This system may well have articulated with the east-west fields that form part of the co-axial system focused on the meandering trackway 200m to the west of the quarry boundary, whilst within 1.5km to the north and north-west the field system becomes more mixed in its character.

The Castleford to Doncaster Roman road (28b; Margary 1973) runs along the eastern edge of the quarry and Buffer Zone and it is notable that none of the strip fields in the eastern part of the quarry appear to be aligned to it, either in parallel or at right angles. Indeed, visually it would appear that the road has cut across their line. A number of Roman coin finds and a bronze brooch have been found in the vicinity of the Roman road (Doncaster Museum; Thorp 1974, 143). Roman coins have also been found to the north-west of the quarry (Doncaster Museum; NMR_NATINV-55872).

Archaeological Investigations

Pickburn Leys

Archaeological excavations were carried out in advance of a proposed south-eastern extension to the quarry in 1993, into the area of the Buffer Zone where cropmark visibility is best. Excavations were carried out in five small areas in the cropmark landscape, the locations of three of which were designed to date and sequence the development of certain rectilinear enclosures and a double-ditched trackway. The other two areas investigated a pair of roundhouses, which may represent an earlier unenclosed settlement. One of these appears to have been incorporated into the perimeter of a field corner enclosure. The results revealed the cropmarks to have been the product of more than one phase, the finds, including a notable assemblage of Iron Age pottery, suggesting that the enclosure site was pre-Roman, as was also inferred by the apparent relationship with the Roman road. The double-ditched trackway and field sytem were determined to be of 2nd to 3rd-century Roman origin from the pottery recovered (Sydes 1993; Ref. No. 6025).

The Red House Project

Numerous archaeological investigations have been undertaken immediately to the north of the quarry, although these were not undertaken in advance of mineral extraction. Rather, they were carried out in advance of ground works relating to development. An early evaluation here saw a section of the metalled surface of the Castleford to Doncaster Roman road (28b) exposed and recorded (Francis 1995; Ref. No. 6040). Subsequently, more extensive archaeological interventions were carried out on either side of the Roman road. Four geophysical surveys, undertaken at various stages of the project, supplemented the fragmented cropmarks and revealed greater evidence for the very mixed arrangement of fields and enclosures that existed in this area (ARCUS 1996a; Ref. No. 3000; Whittingham 1999a; Ref. No. 3022; Northamptonshire Archaeology 2000; Ref. No. 3072; Webb 2001b; Ref. No. 3043). As was seen in the quarry Buffer Zone to the south, there was little spatial evidence of the enclosures and field systems here having any regard for the road's course. Subsequent excavations concentrated on the different types of enclosure revealed, all of which are dated generally to the later Iron Age and Roman period (NAA 1996; Ref. No. 6156; Northamptonshire Archaeology 2001; Ref. No. 6045; Upson-Smith 2002). Two of the enclosures found here were simple sub-rectangular enclosures appended to long field boundaries. Three others, however, in keeping with the rather mixed nature of the field system here, were very different morphologically and included a subdivided trapezoidal enclosure with a corner sub-enclosure, a subdivided oval enclosure and a sub-rectangular enclosure with internal divisions and a later added enclosure. The circumstances of these latter three enclosures suggest that elements of the field system had developed around them. The dating evidence suggests that the enclosures are of later Iron Age origin, and continued in use into the Roman period (2nd to 4th centuries).

Skellow

Archaeological investigations in advance of a park and ride scheme were carried out about 1km to the south-east of the Buffer Zone. Geophysical survey (Gidman and Schofield 2003; Ref. No. 3034) revealed an L-plan trackway with a trapezoidal enclosure appended to its western side, whereas cropmark data only revealed a small portion of the trackway. Subsequent evaluation by trial trenching revealed evidence of a pit alignment, and established that the field system was largely of pre-Roman Iron Age origin and that the enclosure was probably a later Romano-British addition (NAA 2004; Ref. No. 6084). The evidence corresponds with the chronological succession found at the Pickburn Leys site within the Buffer Zone (Sydes 1993) and with the general conclusions drawn from the wider cropmark field system's relationship with the Roman road.

Impact Assessment of Future Extraction

The archaeological potential of the original Brodsworth Quarry would be considered low to moderate on the basis of the cropmark data. The revelations from the geophysical survey work carried out to the north would suggest that a considerable part of the ancient landscape has been lost without record. The potential of the more coherent cropmark field and enclosure system of the Buffer Zone might therefore be considered to be moderate to high, especially given the confirmed Iron Age settlement potential realised through the excavations carried out at Pickburn Leys.

46. The Armthorpe Area

Armthorpe Quarry (Armthorpe; SE 6570 0520; Fig. 7.30)
Status: Active Sand and Gravel
Solid Geology: Sherwood Sandstone
Drift Geology: River Terrace Deposits, Glaciolacustrine Deposits, Peat
Soil: 711p Dunkeswick Series, 712i Foggathorpe Series, 551b Cuckney Series

Dunsville Quarry (Hatfield; SE 6540 0770; Fig. 7.30)
Status: Active Sand and Gravel
Solid Geology: Sherwood Sandstone
Drift Geology: River Terrace Deposits
Soil: 712i Foggathorpe Series, 551b Cuckney Series

Nutwell Lane Quarry (Armthorpe; SE 6404 0306; Fig. 7.30)
Status: Inactive Sand and Gravel
Solid Geology: Sherwood Sandstone
Drift Geology: Glaciolacustrine Deposits, River Terrace Deposits
Soil: 821b Blackwood Series, 551b Cuckney Series

Extraction History

Butterley Aggregates Limited gained planning permission at Armthorpe Quarry in 1994, followed by a determination in 2000 which included an archaeological condition. The quarry is currently owned by Cemex UK Materials, who took over RMC Aggregates (UK) Limited in 2004. An application to extend the quarry has been submitted to Doncaster MDC and a decision is pending. A small quarry is depicted on the first edition Ordnance Survey map to the south of Armthorpe Quarry (OS 1854c).

Planning permissions for Dunsville Quarry date back to 1952, although it is believed that extraction has occurred here since the beginning of the 20th century. Dunsville Quarry is currently owned by Marshalls Mono Limited (Cameron *et al.* 2005) and operates under a permission granted in 1997. South Yorkshire Sites and Monuments Record were consulted during the planning process, but no archaeological condition was recommended (R. Sykes pers. comm.).

Nutwell Lane Quarry operated under an application granted in 1968 (Sykes pers. comm.).

Archaeological Potential

Cropmark visibility in the Armthorpe/Edenthorpe area is very variable. On the one hand there is one of the most extensive (2km^2) and convincing areas of brickwork plan field systems immediately to the east of Edenthorpe, with less extensive areas of rectilinear co-axial and mixed field systems to the west and south of Hatfield and to the west and south of Armthorpe. Relatively few cropmarks are known to the east of Armthorpe and Dunsville, although intermittent fragments of cropmark field systems give reason to suppose that this area is not devoid of archaeology. As was originally highlighted by Riley (1980, fig. 9) soil changes clearly have a bearing on cropmark visibility in this area, the less sandy areas revealing very little. One of the blankest areas occurs on West Moor to the north-west of Armthorpe Quarry where a circular area of peaty, clay and silt soils have accumulated so curtailing the eastward visibility of the Edenthorpe brickwork field pattern, a topographical phenomenon that it has been suggested may be due to an ancient meteor crater (G. Gaunt pers. comm.).

With respect to the quarries, only Dunsville Quarry has definitely covered an area of a former field system, whilst Nutwell Lane and Armthorpe quarries both have linear cropmarks running towards them. There are no cropmarks in the close vicinity of Hatfield Quarry. The archaeological potential, particularly around Dunsville and Nutwell Lane quarries is also indicated by spot finds in these areas. A Neolithic polished stone axe and a Bronze Age flint dagger were found just to the east of Dunsville Quarry and several metal implements of unknown date were also found to the north of this quarry, along with two Roman coins and Roman pottery (Doncaster Museum). Within 0.5km to the west have been found two prehistoric flints (Van de Noort and Ellis 1997), a Bronze Age socketed spearhead and an Iron Age beehive quern (Doncaster Museum). At Nutwell Lane Quarry, the stray finds include a Neolithic flint axehead (Doncaster Museum). A number of

Roman finds were also discovered to the west of Nutwell Lane Quarry comprising pottery, coins and brooches (Doncaster Museum). Additionally, a quern was found about 1km to the south-west of Armthorpe Quarry (Doncaster Museum), whilst several prehistoric flints were discovered within 1.5km to the north-west (Van de Noort and Ellis 1997).

Archaeological Investigation

Numerous archaeological interventions have been carried out within the Armthorpe area, although few have been undertaken in relation to mineral extraction. The largest landscape investigation has been undertaken in advance of the development of the industrial estate at West Moor Park, where archaeological investigations are still ongoing. The findings at West Moor Park have a particular bearing on our perceptions of the archaeology in this area, upon future extraction in this area, and specifically upon the area around Armthorpe Quarry.

Armthorpe Quarry and West Moor Park

The only archaeological investigation carried out at Armthorpe Quarry comprised an environmental assessment (RMC Aggregates (UK) Limited 2000), followed by a desk-based assessment, which highlighted the archaeological potential of the area (ARCUS 2006). A proposed quarry lies 500m to the north-east of Armthorpe Quarry at Low Grounds Farm. An environmental assessment for this site was undertaken, although this did not include an archaeological report (Geoplan Limited 2000). A desk-based assessment was subsequently carried out (JSAC 2003), followed by a geophysical survey (GSB 2004; Ref. No. 3074) and an evaluation revealing evidence of gullies of uncertain date or function (Foard *et al.* 2005; Ref. No. 6168). The application is still pending a decision.

The earliest archaeological interventions in the vicinity of Armthorpe Quarry involved the excavation of test pits, which uncovered two pit features of uncertain date or function (JSAC 1995; Ref. No. 6157). A geophysical survey (Hale 1996; Ref. No. 3010), followed by trial-trenching (Rosenberg and Williams 1996; Ref. No. 6022), was undertaken prior to the construction of the M18. These were the detected elements of what was interpreted as an agricultural landscape of enclosed field systems and trackways, a conclusion not confirmed until large-scale open area excavations were carried out on the West Moor Park site, 1km to the west of Armthorpe Quarry, from 2001 onwards.

The investigations at West Moor Park have employed the techniques of geophysical survey and excavation in revealing an extensive regime of ancient land division in an area which is virtually devoid of cropmarks. The earliest archaeological intervention saw an evaluation at Rands Lane in which Roman enclosures and post-hole structures dating to the 2nd to 3rd centuries were revealed (Burgess 1999b; Ref. No. 6037). Domestic, industrial and funerary evidence was also recovered from this site, along with agricultural activity.

The excavations at West Moor Park revealed an extensive system of regular brickwork plan fields, accessed via a system of trackways, which articulated with a more irregular complex of earlier Late Iron Age/Early Romano-British ironworking enclosures, demonstrating brickwork fields infilling areas of the landscape around earlier enclosures (Burgess and Richardson 2003; Richardson 2001b; Ref. Nos 6005 and 2002; Rose and Richardson 2004; Ref. No. 6006; Gidman and Rose 2004; Ref. No. 6054). The truncation of the features at West Moor Park precluded the survival of most features, and the shallow fills in the bases of the ditches were, for the most part, typically unrewarding in their content. The remarkable exception was seen in two discrete locations within the ditch system, which together produced well over 4000 sherds of pottery, most of it manufactured locally. Such rare concentrations of finds might suggest dumps associated with former settlement foci situated within the brickwork system here, but these settlements have proved invisible to all forms of remote sensing and invasive investigation, and are not accommodated within the nomenclature of cropmark typology. All the pottery recovered was Romano-British in date, but was of 2nd to 3rd or 3rd to 4th-century types. Although the pottery suggests that the brickwork fields at West Moor Park were probably created and used only in the Romano-British period, rather than the Iron Age, the range in dating clearly indicates longevity of use, and perhaps abandonment in the 4th century AD. The quantity of pottery from West Moor Park is unprecedented for a brickwork field system site in South Yorkshire, or indeed for any rural site in the region bar the villas. Whilst the majority of the evidence is for Late Iron Age and Romano-British activity, there was little evidence for earlier activity in the form of Late Neolithic and Early Bronze Age pottery.

Excavation at the western edge of West Moor Park seemed to demonstrate better preservation and greater evidence for settlement activity, such as the enclosure, potential cremations and oven bases found in 2003 (OA North 2003; Ref. No. 6161) and the south-western area excavated in 2005 and 2006 (Richardson forthcoming; Ref. No. 6160). Although there is clearly a visibility problem with regards cropmarks, it is possible that the areas of settlement and field systems recorded were quite localised. This may be demonstrated by the two evaluations carried out at Rands Lane to the west of West Moor Park (Major 2005; Ref. Nos 6020 and 6135; Webb 2005b; Ref. No. 3076; Rose 2005; Ref. No. 6012) and at the IKEA site at the north-west corner, adjacent to the M18 (Signorelli and Webb 2005; Ref. No. 3079 and 6015). None of these evaluations found any significant archaeology, although truncation is also a possible explanation, given how little of the ditches survived in other places.

Dunsville Quarry

A resistivity survey was initially carried out on the known cropmarks here in advance of extraction, but proved unsuccessful in locating any archaeological anomalies (Magilton 1978, 62-63; Ref. No. 3057). Excavations were subsequently undertaken, which revealed enclosure ditches and a droveway previously seen on aerial photographs (Magilton 1978, 57; Ref. No. 6112). Fieldwalking has been carried out in the Dunsville area as part of the Humber Wetlands Project and has produced a number of flints indicative of prehistoric activity (Van de Noort and Ellis 1997; Ref. No. 9007).

A further geophysical survey, undertaken along the route of a proposed water pipeline at Woodhouse Lane, Hatfield detected linear anomalies (Webb 1998b; Ref. No. 3060) which were subsequently investigated via a watching brief. These ditches are thought to be associated with the brickwork field system of assumed Iron Age/Roman date, although no dating evidence was recovered (NAA 1999; Ref. No. 6115).

Nutwell Lane Quarry

No archaeological investigations have been carried out in advance of extraction here. The earliest known archaeological investigation undertaken close to Nutwell Lane Quarry was a geophysical survey 650m to the north of the quarry in advance of residential development in 1995. This found a number of linear anomalies that were deemed to form part of a brickwork field system and discrete anomalies suggesting a level of domestic activity (Cumberpatch and Webster 1998, 19; Ref. No. 3046; GSB 1995; Ref. No. 3003). Fieldwalking produced several flints and Roman pottery. The excavation of two trenches revealed a series of pits, some of which were later cut by boundary ditches (Cumberpatch and Webster 1998, 19-21; Ref. No. 6061).

Impact Assessment of Future Extraction

Armthorpe Quarry and Nutwell Lane Quarry lie within an extensive designated Safeguarding Area which contains two Preferred Areas and two Areas of Search (Skinner 1998). Preferred Areas are located to the east of Armthorpe Quarry, whilst Areas of Search flank Armthorpe Quarry to the north, east and south. The Safeguarding Area encompasses Nutwell Lane Quarry, but excludes Dunsville and Hatfield quarries. The Preferred Areas have no known archaeology and the Areas of Search and Safeguarding Area generally have only a few small areas of sparse cropmarks. Nevertheless, from the results of the excavations carried out in the area, particularly at West Moor Park, it seems very unlikely that the cropmark record is representative of the archaeological potential in this area.

47. The Rossington Area

Hurst Plantation Quarry (Rossington; SK 6381 9888; Fig. 7.31)
Status: Active Sand and Gravel
Solid Geology: Sherwood Sandstone
Drift Geology: Glacial Sands and Gravels, Till
Soil: 541r Wick Series

Stripe Road Quarry (Rossington; SK 6304 9650; Fig. 7.31)
Status: Inactive Sand and Gravel
Solid Geology: Sherwood Sandstone
Drift Geology: Glacial Sands and Gravels
Soil: 541f Rivington Series, 713g Brickfield Series

Hayfield Farm Quarry (Cantley with Branton; SE 6355 0000; Fig. 7.31)
Status: Inactive Sand and Gravel
Solid Geology: Sherwood Sandstone
Drift Geology: Peat
Soil: 1024 Adventurer Series, 551b Cuckney Series

Stancil Quarry (Tickhill; SK 6063 9598; Fig. 7.31)
Status: Inactive Sand and Gravel
Solid Geology: Sherwood Sandstone
Drift Geology: Glacial Sands and Gravels, River Terrace Deposits
Soil: 541r Wick Series

Extraction History

The earliest planning permission known is for Hurst Plantation Quarry, which was granted under an Interim Development Order in 1947 by Bessacarr Gravel Company Limited. This was followed by applications in the 1950s and 1990s when it was operated by Yorkshire Aggregates Limited. (Cameron *et al.* 2005). Since 2004 it has been owned by Doncaster Minerals Limited (V. Bower pers comm.).

ARC Northern Limited operated Stripe Road Quarry in the 1990s (Sydes 1991a), although quarrying finished in 1993. The landowner of Hayfield Farm Quarry, Mr Goforth, submitted two applications in 1990 and 1992. The aggregates were extracted in advance of the excavation of fishponds and the permissions were granted. The earliest and only known planning application for Stancil Quarry was submitted in 1966.

Archaeological Potential

The site of Stripe Road Quarry lies at the centre of an extensive cropmark landscape that includes areas of brickwork plan fields interspersed with complexes of more irregular mixed fields. Within this landscape the brickwork plan strip fields seem to have adopted either a north-east to south-west alignment (in the northern part) or an east-west one (in the southern part). In the northern part of the area they seem to be aligned with a meandering double-ditched trackway. In addition, the landscape boasts the site of the Roman vexillation fortress at Rossington Bridge (Scheduled Monument SY1044), on the south bank of the River Torne, to which lead two Roman roads. The most well documented road is that stretch of the 28b between Bawtry and Rossington Bridge that runs immediately to the west of the Hurst Plantation and Hayfield Farm Quarries. In the centre of the area, running north-south, immediately to the west of Stripe Road Quarry, are sections of a previously undocumented road represented by two straight parallel cropmarks. These were either not seen by Riley, or were not considered to be archaeological in their nature (Riley 1980, map 8). In both cases these roads appear to show total disregard for the plans of the field systems and, as was deduced by Riley for the small section around Warren House Farm (Riley 1980, 17), it seems that this whole landscape was probably laid out and partitioned in the pre-Roman period.

The site of the Roman pottery kilns at Rossington Bridge, which is now a Scheduled Monument (SY1108), is located immediately west of Hayfield Farm Quarry thus highlighting the significant potential for Roman archaeology in the vicinity of this quarry. A small gravel pit is depicted on the first edition Ordnance Survey map at Hurst Plantation Quarry (OS 1854d). In addition, Hurst Plantation Quarry has the word 'Ruins' annotated on the first edition OS map to the east of the present extraction area (OS 1854d). Fieldwalking and metal detecting, particularly in an area immediately to the east of Rossington Bridge, has produced a large number of prehistoric stone tools as well as Roman coins, metalwork and pottery (Doncaster Museum; Ref. No. 9021).

Archaeological Investigations

Hurst Plantation Quarry

A desk-based assessment was initially carried out at Hurst Plantation Quarry followed by an evaluation in advance of aggregates extraction. Whilst the desk-based assessment identified clear archaeological potential in the area, no archaeology was encountered during the fieldwork and it is likely that the cropmarks had already been ploughed out (Badcock and Symonds 1994b, 28-29; Ref. No. 6046).

Stripe Road Quarry

A similar degradation of cropmarks might explain the poor results also obtained as a result of ARC Northern Limited's application for sand and gravel extraction at Stripe Road Quarry, near Hunster Grange Farm. The cropmarks, part of the brickworks aligned with the meandering trackway (see above), were targeted by trial trenches. Little archaeological evidence was found to confirm the

cropmark data, with only shallow or discontinuous ditches being revealed in some places suggesting truncation through modern agricultural practices (Sydes 1991a, 22; Ref. No. 6152).

Further work at Stripe Road was undertaken in advance of residential development (Chadwick 1993, 43; Ref. No. 6058). This revealed ditches that formed part of a field system considered to be later Iron Age/Roman in date, although no dating evidence was recovered. An additional residential development at Church Field, Stripe Road, was evaluated by geophysical survey and then trenching. The uncovered ditches were deemed to represent a single phase of agricultural activity (unlike previous excavation on the brickwork plan fields at Edenthorpe and Armthorpe where several phases have been identified). Few finds were recovered providing little dating evidence, although an Iron Age date is postulated (Atkinson 1998; Ref. Nos 3070 and 6048).

Further archaeological work at Rossington at All Saints School found no evidence of the cropmarks that were projected onto the site and it is suspected that they had been previously lost, either to deep ploughing or the landscaping of the school grounds (Webb 2006; Mc Cluskey 2006; Ref. Nos 3077 and 6159).

Hayfield Farm Quarry

An archaeological evaluation was undertaken at Hayfield Farm Quarry in advance of aggregates extraction in which heat shattered pebbles were recovered (Atkinson 1993, 65-6; Ref. No. 6030). The site is located in close proximity to the concentration of Roman pottery kilns at Rossington Bridge (Scheduled Monument SY110). Excavations at this site were carried out between 1956 and 1961 revealing kilns dating to the 1st/2nd centuries AD (Buckland *et al.* 2001; Ref. No. 6143). Additional kilns were excavated by an amateur archaeologist in 1960 across the river from the original site and a proton magnetometer survey, undertaken in 1963-5, detected a further ten kilns (Van de Noort and Ellis 1997, 278; Ref. No. 3045).

Other archaeological interventions in the vicinity of the quarry comprise a geophysical survey and evaluation at Warning Tongue Lane, Bessacarr to the west of the quarry in advance of residential development. This revealed semi-circular anomalies suggesting an enclosure or ring ditch, along with possible pit features (Atkinson and Merrony 1994, 24). The evaluation uncovered an enclosed field system with evidence of agricultural and domestic activity and probable small-scale pottery production. The site is dated to the 2nd to 3rd centuries AD, based on pottery, although stratigraphically earlier features suggest that there was occupation prior to this (Atkinson and Merrony 1994, 27; Ref. No. 6101).

To the south-west of Hayfield Farm Quarry and to the north-west of Hurst Plantation Quarry is the Roman vexillation fortress at Rossington Bridge (Scheduled Monument SY1044). A geophysical survey has detected the northern corner of the defensive circuit but not all the anomalies, or the linear features found in trenching, are consistent with the cropmark record. Whereas most of the

cropmarks here are deemed to be pre-Roman by virtue of their perceived relationship with the Roman road, one linear boundary appears to mirror the plan of the fort and therefore could indicate Roman period modifications to the land regime here, as might be expected close to the fort (Van de Noort and Ellis 1997; Ref. No. 3026; Schofield 2003; Ref. No. 3044; NAA 2003a; Ref. No. 6065).

Stancil Quarry

Although the quarry lies within an area of a mixed cropmark field system, no archaeological interventions have been carried out in association with mineral extraction. Excavations have taken place in the vicinity at Stancil Farm, 300m to the north-east, where a Roman villa has been identified dating to the 3rd century AD, although it has been suggested that there was an earlier building here. A bath-house with a hypocaust system has been identified and it has been theorised that the villa had two wings. Numerous skeletons have also been recovered from the excavations, although the dating of these is uncertain (Whiting 1941, 269; Ref. No. 6106). A watching brief at Garth Cottage, Stancil, 400m to the north-east of the quarry, was negative (ARCUS 1999; Ref. No. 6098).

Impact Assessment of Future Extraction

There is a designated Safeguarding Area around Hayfield Farm Quarry, Hurst Plantation Quarry and to the south and east of Stripe Road Quarry (Skinner 1998). In general, the archaeology of this area is very visible in terms of cropmarks, but geophysical surveys and what little excavation has taken place, indicate that there are not only areas where there is more than is indicated in the cropmark record, but also areas where erosion has removed the cropmarks entirely. No large-scale excavations have taken place in this landscape and conclusions and interpretations are therefore based on very little data, coupled with circumstantial evidence. Despite this the archaeological potential of the area must be regarded as high. If opportunity arises, future mitigation in advance of further quarrying might endeavour to confirm the courses of the two Roman roads and establish stratigraphically their relationships with the field system.

Postscript

Three Current Planning Applications for New Quarries within the Study Area

Bay Horse Farm Quarry (Fairburn; SE 4729 2899)
Status: Inactive Magnesian Limestone

Extraction History
Whilst there is no known history of quarrying in the vicinity, former quarry workings are shown on the first edition Ordnance Survey map on the southern edge of the proposed quarry (OS 1852). The planning application has been submitted by Lafarge Aggregates Limited (Gresty 2006b).

Archaeological Potential
Fragmentary rectilinear cropmarks exist within the proposed quarry site including several enclosures and field boundaries of probable Iron Age/Roman date.

Archaeological Investigation
Several archaeological interventions have been carried out within the proposed quarry site including geophysical surveys and excavations in advance of the A1 (M) road scheme. The geophysics hinted at further evidence for an ancient enclosed landscape in an area with no cropmarks (ASUD 2001; Ref. No. 2034) and was confirmed by an open area excavation (Brown *et al.* Forthcoming; Ref. No. 5133, Site FHM/H-I/03). A radiocarbon date of 3700-3520 cal BC was provided from an evaluation trench to the south at Site FHM/F-G/03, which revealed multi-period activity from the early prehistoric period onwards (Brown *et al.* forthcoming).

Impact Assessment of Future Extraction
The archaeological potential within the proposed quarry site is high with numerous unexplored cropmarks. This is corroborated by the archaeological investigations already undertaken in the area.

Land at Redhill, Selby Fork (South Milford; SE 4709 2997)
Status: Inactive Magnesian Limestone

Extraction History
There is no known history of aggregates extraction within the proposed quarry site. The application has been submitted by Mansfield Securities Limited.

Archaeological Potential
There are no known cropmarks within the proposed extraction site, although rectilinear cropmarks are present 200m to the north and 400m to the west of the site. Those to the north are characterised

by probable enclosure ditches, whilst those to the west represent a trackway and all are of probable Iron Age/Roman date.

Archaeological Investigation

Archaeological interventions have been undertaken in the vicinity in advance of the A1 (M) road scheme including trenches FHM/XX17/03, FHM/K/03 and FHM/H-I/03. The latter trench yielded evidence of Iron Age/Romano-British enclosure ditches and a possible pit alignment (Brown *et al.* forthcoming).

Impact Assessment of Future Extraction

The archaeological potential within the proposed extraction site is low to moderate based on the available evidence.

Land at Lumby (South Milford; SE 4792 3007)

Status: Inactive Magnesian Limestone

Extraction History

Whilst there is no known history of mineral extraction at the proposed extraction site, two former quarry workings exist on the first edition Ordnance Survey map to the south of the site (OS 1850b). The planning application has been submitted by E. Making and Sons and Mr R. Stoker.

Archaeological Potential

Whilst no cropmarks lie within the proposed quarry site, an extensive enclosed field system exists approximately 600m to the north-east. This includes several double-ditched trackways that divide the fields, some containing corner enclosures. Discrete anomalies within these enclosures indicate settlement activity. A Roman coin has been found to the north of the proposed extraction site (PAS, YORYM-44D710)

Archaeological Investigation

No archaeological interventions have been undertaken within the proposed extraction site, although geophysical surveys and excavations have been carried out in advance of the A1 (M) road scheme 500m to the west. These include the same trenches as at Selby Fork (Brown *et al.* forthcoming).

Impact Assessment of Future Extraction

The archaeological potential within the proposed extraction site is low, although this increases to high in parts of the surrounding area.