

The Magnesian Limestone in South and West Yorkshire
Archaeological Assessment Project
(3860 MAIN)

Air Photo Mapping Project

MANAGEMENT OVERVIEW:
SUMMARY OF RESOURCES AND RESULTS

NMR Parent Collection UID: EHC01/009
NMR EVENT UIDs: 1409196 & 1439269
ASWYAS Report No.
Project dates: March 2005 – ongoing
Project authors: Alison Deegan, Matthew Oakey, Daniel van den Toorn,
Cinzia Bacillieri
Report produced : July 2006
Report by: Alison Deegan for Archaeological Services WYAS

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1 SUMMARY

The Magnesian Limestone in West and South Yorkshire Air Photo Mapping Project and the subsequent extension to that project's area are funded by the Aggregates Levy Sustainability Fund as disbursed by English Heritage. This project is operated by Archaeological Services, West Yorkshire Archaeology Service.

Two-fifths of the county of South Yorkshire and smaller parts of North Yorkshire were surveyed to English Heritage's National Mapping Programme standards from existing air photographs. Digital maps, at a nominal scale of 1:10,000, and supporting records were created by a team of three aerial investigators. This team was contracted by Archaeological Services WYAS and based with English Heritage's Aerial Survey (North) at Tanner Row, York.

New National Monument Record entries were created for 717 monuments or monument groups and a further 263 amendments or enhancements were made to existing records.

2 INTRODUCTION

The Magnesian Limestone Air Photo Mapping Project is an element of the Magnesian Limestone in South and West Yorkshire Archaeological Mapping and Assessment Project (hereon Magnesian Limestone Project). This is a multi-disciplinary project that aims to integrate the results of past excavation, geophysical survey and field walking with the information from high quality air photo mapping. It is funded by the Aggregates Levy Sustainability Fund (ALSF) as disbursed by English Heritage (EH).

The air photo mapping element was carried out to EH's standard National Mapping Programme (NMP) specification by a small team of interpreters contracted by Archaeological Services WYAS (ASWYAS) and based with EH's Aerial Survey and Investigation team at Tanner Row, York.

The NMP is ongoing and is generating a comprehensive record of the archaeology that is visible on air photographs for the whole of England. So far, approximately 33% of the country has been covered by the programme.

Work on air photo mapping began on 3rd March 2005 and to date mapping for all 23 map sheets in the original project area was completed in February 2006.

In December 2005 ASWYAS applied for and received further funding from the ALSF to extend the project area further eastward by 9 map sheets.

As of the end of May 2006 air photo mapping is complete for 6 of these 9 sheets. At this point the project was temporarily suspended to allow the team to work on the Rapid Coastal Zone Assessment of the Yorkshire Coast and Humber Estuary. Work on the 3 remaining map sheets will resume in December 2006.

3 AIMS AND OBJECTIVES

The overarching aim of the Magnesian Limestone Project and its extension is to "redefine baseline knowledge (of the ancient landscapes of the Magnesian Limestone) and so enable future aggregate extraction to be mitigated more appropriately within a considered archaeological research framework" (Roberts and Deegan 2005, 2). The project design submitted in application to the ALSF details the wider aims and objectives of this study (Roberts and Deegan 2005).

The aim of the National Mapping Programme is to produce a comprehensive record of the archaeology of England, from prehistory to modern times through the interpretation and mapping of remains that are visible as earthworks, crop marks, parchmarks and soilmarks on air photographs.

4 SCOPE OF THE SURVEY

4.1 Geographical scope of the survey

The original Magnesian Limestone Project covers an area of 1275km² or 51 OS map quarter sheets (5x5km) (Figure 1). Parts of this project area had previously been mapped to the NMP standard for the Lower Wharfedale NMP Project (NMR event UID 1359072) or the Vale of York NMP Project (NMR event UID 1105240). The remaining 23 map sheets, an area of 575km² were covered by this AP mapping project.

In December 2005 ASWYAS extended the project area to encompass the eastern part of South Yorkshire. The extension area covers a further 225km² (9 map sheets) (Figure 1).

4.2 Archaeological Scope

The scope of the NMP is documented in the Sphere of Interest draft report (RCHME 1997).

5 SOURCES

5.1 Air Photographs

The following collections were consulted by the AP mapping project, full contact details for each collection are given in Appendix 4:

Collection Name	No. of oblique APs (ML project/ extension)	No. of vertical APs (ML project/ extension)
National Monuments Record	8480/220	c. 17570/1630
Unit for Landscape Modelling	649/48	183/111
North Yorkshire HER	109/0	None consulted
South Yorkshire SMR	183/not yet checked	None consulted

5.2 Existing records

The National Monuments Record database was routinely consulted. This process was assisted by the output from English Heritage's GIS, HSIS, which facilitates graphic representation of the records with attached summary data.

Data for the project areas from the Sites and Monuments Record for North Yorkshire and South Yorkshire was made available by Nick Boldrini, HER Officer and Louisa Matthew, SMR Officer respectively. Where possible the records that were created or enhanced by this project were concorded with the HER/SMR records supplied by the counties.

6 METHODOLOGY AND RECORDING

6.1 Mapping Methods

All the available air photographs from the specified sources were examined under magnification and stereoscopically where possible. Photographs selected for transcription (rectification and mapping) were scanned at a suitable resolution, this was usually 300-600 dpi, and output as uncompressed TIFF format images (.TIF). Where permission to scan was not forthcoming from the copyright holder the necessary information was traced onto acetate sheets and these were scanned and rectified.

Scanned images were rectified using the specialist software AERIAL5.18 until April 2004 and subsequently AERIAL5.29. Control information was mostly derived from the Ordnance Survey Land-Line™ 1:2500 scale vector maps, which were also used as a base for mapping. Height information from the OS Land-form Profile™ (5m vertical interval, 1:10,000 scale) was used to create Digital Terrain Models in AERIAL where the topography rendered this necessary.

Accuracy for the Ordnance Survey raster 1:2500 maps is in the range of $\pm 2\text{m}$ and rectification of photographs is normally within $\pm 2.5\text{m}$.

Rectified images were output from AERIAL in uncompressed TIFF format at a resolution of 300-600 dpi and a scale of 1:2500. A World file (.TFW) was created alongside each TIFF file and the control information was retained in the AERIAL RDA file (.RDA).

Individual digital drawings were created for each map sheet in Autodesk Map®. The rectified image was placed into the relevant map drawing, the information in the World file determined the image's correct position and scale. The archaeological features were then digitised from the photograph into the standard NMP layers using the established NMP conventions (see Appendix 1).

6.2 Recording Strategy

There are two strands to the NMP recording strategy. The main strand is the creation of new or the enhancement of existing monument records in the National Monument Record (NMR) database. The NMP-generated entries or enhancements for each monument or monument group in this database record the key locational information, the monument types present and their dating, the nature of the evidence, a free text description of the monument or monument group, the source of record information (i.e. photograph and any bibliographic or cartographic references) and administrative details such as concordance with SMR/HER records, record authorship, and links to events and archives.

To assist in the management and querying of the actual map data in the Autodesk Map® environment and in ultimately in English Heritage's GIS a summary of some of the database information is attached to each individual mapped feature. Two tables of data are attached to each feature, the content of these tables is listed Appendix 2.

7 PROJECT MANAGEMENT

This project started on 3rd March 2005. The mapping and recording for the project was carried out by Matthew Oakey, Daniel van den Toorn and, from June 2005, Cinzia Bacilieri. Matthew Oakey and Daniel van den Toorn left the project at the end of April 2006 and the end of May 2006 respectively. Alison Deegan was the project team leader. Dave MacLeod was the Aerial Survey and Investigation Project Officer and Yvonne Boutwood (EH) the first point of contact for matters of interpretation, recording and NMP standards.

The overall time spent on the original project area and the extension area to date was allocated to the different tasks as follows:

Tasks	Total person days to date
Mapping & recording	550
Management of NMR & SMR loans	97
NMP Annual Meeting, Liaison Group meetings and others	33
Project Management	13
Other tasks : general administration data checking & administration technology refresh and computer down-time field trip receiving and assisting visitors	44
Management report	4
Data export & dissemination	4
<i>Total</i>	<i>745</i>

This summary does not include the day to day contribution made to the project in terms of support, advice and assistance by DM, YB and other members of Aerial Survey York.

The average time required to map and record each of the 29 map sheets completed so far was 19 days. This is an exceptional rate of production in an area of complex archaeological landscapes and high volumes of vertical photographs. The team are to be

credited with their speed and efficiency particularly given that one member (CB) was new to the NMP process when she started on this project. Furthermore this amply demonstrates that detailed mapping (creating polygons instead of polylines for all banks and ditches) and attaching summary data to each object are no impediment to rapid survey. Though this is not to say that with streamlined procedures and a change of software improvements could not be made.

The management of photographs loaned from the NMR took significantly longer than the time allocated in the original project design. The two main factors are the exceptionally high volume of coverage for this part of the country and the number of requests from the NMR for return of small parts of loans. In addition photographs were often supplied out of order and had to be re-ordered for checking in and re-ordering for mapping. Sorting and siting vertical photographs is a time consuming process. One possible solution is that the NMR supply the material ready for use and charge external NMP projects for this service. This cost would be offset by the reduction in AP team time spent on loan management.

The main outstanding tasks on this project area as follows

- Mapping and recording 3 map sheets,
- Checking 3 map sheets,
- Export 3 map sheets,
- Re-organisation and return of final 2 loans to NMR and any intervening returns,
- Supply of map data to NMR & ASWYAS,
- Finalise source lists (NMR, ULM, SMR/HER) and
- Work on this project will resume in December 2006

8 QUANTIFICATION OF PROJECT RESULTS

This project has created 717 new NMR records and made amendments or enhancements to at least another 263 records to date. A breakdown of the number of new and amended records by map sheet is provided in Appendix 4.

Of the new and amended records 765, or nearly 80% were not previously recorded in the databases of the relevant Sites and Monument Record (as supplied during the course of the project). Breaking this down into the two counties, of the 73 NMR records created or amended in North Yorkshire 49 were not recorded in that county's HER and 716 of the 907 records created or amended in South Yorkshire were not previously recorded in its

SMR.

It is important to note that in its current form the data produced by most NMP projects, including this one, cannot be used to generate detailed distribution plots or quantifications on a “by monument” basis. Each NMR record contains an index of the different monument types that are present but not the numbers of each type, though this information should be included in the free text field. Furthermore because monuments are not individually grid referenced in any searchable field only basic distribution plots can be obtained. In the Autodesk Map® drawings a single monument may contain many discrete elements (polylines and hatches), each of which will be represented by an entry in the attached data tables thus grossly inflating the results of any count conducted on the subjects of any of the fields. In neither context can a definitive count be achieved nor is it possible to extrapolate a detailed distribution of point data. Between 1994 and 2001 Northamptonshire County Council produced for English Heritage an NMP project whose data could be used to these ends (Deegan and Foard forthcoming). For that project all the mapped elements of individual monuments were combined to produce stable monument units that were directly correlate with the entries in the project’s record database (MORPH2.2).

9 OVERVIEW OF PROJECT RESULTS

Nearly half of the records created or amended by this project so far pertain to features of Roman or earlier date. Over a third record medieval or post-medieval features and approximately 15 percent relate to twentieth century military remains. Seventeen percent are recorded as date uncertain, mostly these are short lengths of ditch with no diagnostic features.

PERIOD	No. of NMR records (nb some records may be attributed to more than 1 period)
PREHISTORIC	86
IRON AGE OR ROMAN	383
EARLY MEDIEVAL	2
MEDIEVAL	64
POST MEDIEVAL	286
20TH CENTURY	154
UNCERTAIN	210

The most striking features are the extensive late prehistoric or Roman date landscapes comprising long trackways, sweeping field systems and associated enclosures. These

are visible in a broad swathe running north-west to south-east between South Elmsall (West Yorkshire) and Tickhill (South Yorkshire) and are known from the Lower Wharfedale NMP Project to extend further northward at least as far as Kirk Deighton (North Yorkshire) and southward through Nottinghamshire (Riley 1980). North of Doncaster these landscapes are closely linked to the areas of Magnesian Limestone, no doubt because the soils are freer draining than on the neighbouring Coal Measures. However south of Doncaster there are relatively few cropmarks to be seen on the Magnesian Limestone and instead they are more profuse on the Permian & Triassic sandstones to the east.

There is considerable diversity within these landscapes and whilst some may be similar to Riley's "brickwork plan" field systems perhaps the differences as well as the similarities warrant further consideration (1980, fig. 3).

There are relatively few earlier prehistoric monuments visible on the air photographs; a Ferrybridge Henge type complex is apparently absent. Of note though is the large irregular curvilinear enclosure near Brodsworth (NMR UID 620727) which is similar to the enclosure south of the M62 near Ferrybridge (NMR UID 1404145).

The existence of the Roman fort at Rossington was well known before this project (eg Riley 1980 Map 8). However a possible fort (NMR UID 1434249) on the banks of the River Don at Long Sandall, north of Doncaster and 3.75km of possible Roman road (NMR UID 1439042) to the west of that town are potentially exciting new discoveries but now require further work to confirm or otherwise their interpretation.

The two monuments attributed to the early medieval period are the earthwork embankment known as Roman Bank at Serlby, Nottinghamshire (NMR UID 1434945) and the remains of All Hallows Church, Dadesley, South Yorkshire (NMR UID 318940). Any formal dating evidence for the former was not available at the time of record creation.

Sites of known or possible medieval data are sparsely distributed. These comprise sites and structures such as the motte and bailey castles at Conisborough, Tickhill and Laughton en le Morthen (NMR UIDs 318744, 318539 and 318964), moated sites at near Bawtry, Thorpe in Balne and Bentley (NMR UIDs 321045, 56094, 55798) as well as a few fishponds, hollow ways and banks. Ridge and furrow ploughing is fairly widely distributed and is present on a large proportion of the open land north of Doncaster. However very little of this ploughing has been confidently dated to the Medieval period and most is thought to be of post medieval date.

Other post medieval features recorded by this project include extraction sites, garden

features and trackways.

This project has also record a wide range of twentieth century military features (see Appendix 5 for list of EH Thesaurus terms indexed by this project to date).

10 DATA ARCHIVING AND DISSEMINATION

10.1 Copyright

The copyright of the air photo mapping and associated records produced by this project lies with English Heritage. Licence to use this data has been extended to the ASWYAS, North Yorkshire HER and South Yorkshire SMR.

With permission from the copyright holders, this project scanned a large quantity of photographs. Copyright of this digital data is retained by the original copyright holders.

10.2 Project Archive

This project has so far produced 29 Autodesk Map® drawing files, one for each whole map sheet completed to date. These will be deposited with the NMR archive and Aerial Survey North and South shall also retain digital copies.

There is no precedent for the formal archive deposition of other digital data associated with the project: the scanned image files (.TIF), rectified image (.TIF) files, World files (.TFW), AERIAL rectification files (.RDA) and lists of consulted material (.XLS). For the time being this information will be retained by Aerial Survey North.

10.3 Project dissemination

During the course of the Magnesian Limestone Project ongoing results where shared with heritage partners and stakeholders through the format of the Liaison Group Meeting. Three such meetings have been convened to date, on the 15th September 2005, 13th December 2006 and 6th April 2006. A progress report for the AP mapping project was produced for each meeting.

To date each of the 29 Autodesk Map® drawing files have been exported to MapInfo Professional format and supplied to ASWYAS.

ASWYAS have not yet received any of the NMR records for overall project area. The nature of NMR output has been a major issue with the previous options of Rich Text Format or Portable Document Format versions of record reports being impracticable of large scale data interrogation and assimilation with other databases. Following discussions with AD Helen Winton (EH Archaeological Survey and Investigation) has organised the creation of a series of Discoverer workbooks that will facilitate the export of

the NMR data into a series of spreadsheets that can then be linked by monument UID. ASWYAS will now request that NMR Enquiry & Research Services supply them with all the necessary records in this format.

BIBLIOGRAPHY

ASWYAS 2005 *The Magnesian Limestone in South and West Yorkshire*. Archaeological Mapping and Assessment Project. Project Variation. December 2005

Deegan, A and Foard, G forthcoming *Mapping Ancient Landscapes in Northamptonshire*. English Heritage

RCHME 1997 The National Mapping Programme – Sphere of Interest (internal draft document)

Riley, D. N. 1980 *Early landscape from the air*. Department of Prehistory and Archaeology, Sheffield.

Roberts and Deegan 2005 *The Magnesian Limestone in South and West Yorkshire*. Archaeological Mapping and Assessment Project. Revised Project Design. Report no. 1317. January 2005.

APPENDIX 1 AUTODESK MAP® LAYER CONTENT AND DRAWING CONVENTIONS

Layer Name	Layer content	Attached data tables	Layer colour
0	none	none	7 (white)
BANK	closed polygons for supra-surface earthen features such as banks, platforms, mounds and spoil heaps	MONUMENT & MONARCH	1 (red)
BANKFILL	solid fill for bank layer polygons	MONUMENT & MONARCH	1 (red)
DITCH	closed polygons for cut or wear features such as ditches, ponds, pits or hollow-ways	MONUMENT & MONARCH	3 (green)
DITCHFILL	solid fill for ditch layer polygons	MONUMENT & MONARCH	3 (green)
EXTENT OF AREA	closed polygons outlining complex or extensive remains such as mining or army camps	MONUMENT & MONARCH	2 (yellow)
GRID	grid lines at 1km intervals	NONE	7 (white)
MONUMENT POLYGON	closed polygons encircling all the features comprised within a single NMR record.	MONARCH ONLY	7 (white)
RIGARREWK	polyline showing the direction of ploughing in outlines of extant ridge and furrow	MONUMENT & MONARCH	4 (cyan)
RIGARRLEVEL	polyline showing the direction of ploughing in outlines of levelled or crop mark ridge and furrow	MONUMENT & MONARCH	6 (magenta)
RIGDOTSEWK	closed polygon defining the furlongs or extent of area of extant ridge and furrow	MONUMENT & MONARCH	4 (cyan)
RIGDOTSLEVE L	closed polygon defining the furlongs or extent of area of levelled or crop mark ridge and furrow	MONUMENT & MONARCH	6 (magenta)
STRUCTURE	for all stone, concrete, metal and timber features, structures	MONUMENT & MONARCH	7 (white)

Layer Name	Layer content	Attached data tables	Layer colour
	and erections		
T HACHURE	polyline t-hachure convention to schematise sloped features indicating the top of slope and direction of slope.	MONUMENT & MONARCH	5 (blue)
VIEWPORT	an administrative layer to allow printing	NONE	7 (white)

APPENDIX 2 AUTODESK MAP® ATTACHED DATA TABLES

MONUMENT DATA TABLE

The Monument Data Table consists of five fields that are input directly through Autodesk Map®. The content of the MONARCH, PERIOD, TYPE and EVIDENCE fields duplicate that of the related fields in the corresponding NMR entry. In this context the PHOTO field identifies the photograph from which the feature was actually traced. This may not reflect the reference given in the NMR as the latter is intended for the “best illustrative” photograph of the archaeology.

Field name	Field content	Sample data
MONARCH	NMR Unique Identifier (UID)	1,043,117
PERIOD	date of features (EH Thesaurus)	NEOLITHIC
TYPE	monument type (EH Thesaurus)	HENGE
EVIDENCE	Form of remains (EH Thesaurus)	CROPMARK
PHOTO	NMR or other reference for the photograph from which the feature was plotted and its date of photography	ULM BTY/043 05-Jul-1975

MONARCH DATA TABLE

The Monarch Data Table comprises just one field which records the NMR Monument UID.

Field name	Field content	Sample data
MONARCH	NMR Unique Identifier (UID)	1,043,117

APPENDIX 3 MAP SHEET INFORMATION

Map	Block	Author	Date		Days	NMR records	
			Started	Completed		New	Enhanced
SE51NE	1	MO	25/04/2005	27/05/2005	18	37	7
SE51NW	1	DVDT	18/04/2005	05/07/2005	34	32	8
SE51SE	1	DVDT	07/03/2005	21/04/2005	18.5	26	2
SE51SW	1	MO	07/03/2005	27/05/2005	29.5	42	34
SE40SE	2	MO	07/06/2005	19/07/2005	25	43	9
SE50SE	2	CB	19/07/2005	10/08/2005	17	19	7
SE50SW	2	DVDT	29/06/2005	27/07/2005	19.5	28	11
SE60SW	2	CB	21/06/2005	18/07/2005	19.5	16	8
SK49SE	3	MO	28/07/2005	01/09/2005	13.5	41	9
SK59SE	3	DVDT	28/07/2005	07/09/2005	13.5	12	11
SK59SW	3	CB	11/08/2005	26/08/2005	10.5	26	7
SK69SW	3	MO	01/07/2005	17/10/2005	25.5	25	21
SE40NE	4	DVDT	21/12/2005	17/02/2006	29.5	29	13
SE50NE	4	CB	26/08/2005	12/10/2005	18	27	8
SE50NW	4	DVDT	28/10/2005	21/12/2005	31.5	31	17
SE60NW	4	DVDT	02/08/2005	04/10/2005	24	29	2
SK49NE	5	MO	17/10/2005	14/11/2005	17	37	10
SK59NE	5	MO	15/11/2005	19/12/2005	20.5	19	12
SK59NW	5	MO	20/12/2005	17/01/2006	13	26	5
SK69NW	5	CB	27/10/2005	19/12/2005	31	24	19
SK48NE	6	MO	17/01/2006	03/02/2006	13	16	12
SK58NE	6	CB	23/01/2006	25/02/2006	18.5	15	4
SK58NW	6	CB	05/01/2006	23/01/2006	13	15	7
SE60NE	7	DVDT	24/02/2006	13/03/2006	14.5	19	3
SE60SE	7	CB	27/02/2006	13/03/2006	10	15	4
SE61NE	7	-	-	-	-	-	-
SE61NW	7	-	-	-	-	-	-
SE61SE	7	MO	23/02/2006	13/03/2006	11	19	5

Map	Block	Author	Date		Days	NMR records	
			Started	Completed		New	Enhanced
SE61SW	7	DVDT	12/04/2006	23/05/2006	21	26	4
SE70NW	7	CB	13/03/2006	25/04/2006	14	14	3
SE71NW	7	-	-	-	-	-	-
SE71SW	7	MO	13/03/2006	24/03/2006	6.5	9	1

APPENDIX 4 AIR PHOTO COLLECTION DETAILS

National Monument Record
English Heritage
National Monuments Record Centre
Great Western Village
Kemble Drive
Swindon
SN2 2GZ

Heritage Unit
North Yorkshire County Council
County Hall
Northallerton
North Yorkshire
DL7 8AH

South Yorkshire SMR
Howden House
1 Union Road
Sheffield
S1 2SH

Unit for Landscape Modelling
University of Cambridge
Air Photograph Library
Sir William Hardy Building
Tennis Court Road,
Cambridge
CB2 1QB
<http://www.ufm.cam.ac.uk>

APPENDIX 5 EH THESAURUS TERMS INDEXED BY THE PROJECT

A	ABBEY	BUILDING
	AIR RAID SHELTER	DECOY POND
	AIRCRAFT HANGAR	DITCH
	AIRFIELD	DOUBLE DITCHED
	ANNEXE ENCLOSURE	ENCLOSURE
	ANTI AIRCRAFT BATTERY	DOVECOTE
B	BAILEY	DRAIN
	BANK (EARTHWORK)	DYKE (DEFENCE)
	BARROW	E
	BATTERY	ENCLOSED SETTLEMENT
	BELL PIT	ENCLOSURE
	BLAST WALL	EXTRACTIVE PIT
	BOMB CRATER	F
	BOUNDARY BANK	FIELD BOUNDARY
	BOWL BARROW	FIRING RANGE
	BRICK AND TILEMAKING SITE	FISHPOND
	BUILDING	FORT
	BUTTS	FORTLET
C	CASTLE	G
	CAUSEWAY	GARDEN FEATURE
	CHURCH	GATEHOUSE
	CIRCULAR ENCLOSURE	H
	CIVIL DEFENCE BUILDING	HA HA
	CLAY PIT	HANGAR
	COAL MINING SITE	HOLLOW
	COAL WORKINGS	HOLLOW WAY
	COLLIERY	L
	CULTIVATION TERRACE	LIME KILN
	CURTAIN WALL	LIMESTONE QUARRY
	CURVILINEAR ENCLOSURE	LINEAR EARTHWORK
D	D SHAPED ENCLOSURE	LYNCHET
	DECONTAMINATION	M
		MACULA
		MEDIEVAL
		MILITARY AIRFIELD
		MILITARY BASE
		MILITARY BUILDING
		MILITARY CAMP
		MILITARY TRAINING SITE

	MILL POND		RIDGE AND FURROW
	MOAT		RING BANK
	MOTTE		ROAD
	MOUND		ROUND HOUSE (DOMESTIC)
	MUNITION HOUSE		ROYAL OBSERVER CORPS
	MUNITIONS FACTORY		MONITORING POST
N	NARROW RIDGE AND FURROW	S	SAND AND GRAVEL EXTRACTION SITE
O	OPEN CAST MINE		SAND PIT
	ORDNANCE STORE		SANDSTONE QUARRY
	ORNAMENTAL LAKE		SEARCHLIGHT BATTERY
	OVAL ENCLOSURE		SLAG HEAP
P	PATH		SPOIL HEAP
	PEAT CUTTING		SQUARE ENCLOSURE
	PIPELINE		STONE QUARRY
	PIT ALIGNMENT		STRUCTURE
	PIT CIRCLE		SUB CIRCULAR ENCLOSURE
	PIT CLUSTER		TERRACED GROUND
	PIT	T	TRACKWAY
	PITHEAD BATHS		TRAMWAY
	PLATFORM		TRENCH
	POLYGONAL ENCLOSURE	W	WAGONWAY
	POND BARROW		WALL
	POND		WATER STORAGE SITE
	POST MEDIEVAL		WINDMILL MOUND
	POST MILL		WORKERS HOSTEL
	PRACTICE TRENCH		
	PRECINCT		
Q	QUARRY		
R	RADAR STATION		
	RECTANGULAR ENCLOSURE		
	RECTILINEAR ENCLOSURE		
	RETTING POND		

APPENDIX 6 NMR COVERSEARCH REFERENCE NUMBERS

Block	Coversearch no.
1	75560
2	76921
3	79753
4	81334a
5	81334b
6	82764
7	84741 & 84741A