

Longford Industrial Heritage Survey (LIHS)

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PART ONE: DESCRIPTION OF LIHS DESK-BASED STUDY

1.0 INTRODUCTION.

1.1. The LIHS Project.

This report presents the Longford Industrial Heritage Survey (LIHS). The LIHS is a database of 701 features of industrial heritage interest in Longford, with additional information on a further 501 quarries and 2,341 lime kilns, derived from cartographic and written sources (refer Figs. 1-3). The project was commissioned by Longford Local Authorities in 2008, with the aim of producing a searchable computerised inventory of industrial sites in the county. It is intended that this inventory will constitute the initial stage of a broader survey of Longford's Industrial Heritage.

In compiling the LIHS, the parameters defining sites or places of industrial interest have been kept deliberately broad. These parameters are, however, based on a definition of Industrial Archaeology that sees it as 'a period study embracing the tangible evidence of social, economic and technological development in the period since industrialisation' (Palmer 1990, 281). The view of Industrial Archaeology as a period-based rather than a theme-based discipline reflects contemporary understandings that have developed since its emergence in the mid-20th century (Rynne 2006).

1.2. Industrial Heritage.

For Industrial Archaeologists working in Ireland, the period of interest (the 'Industrial Period') is generally understood to extend between 1750 and 1930 (Rynne 1999, 2; Rynne 2006). It should, however, be noted that the cut-off points in both instances are somewhat artificial and that industrial processes and remains dating from before and after the period in question sometimes fall within the remit of Industrial Archaeology. Thus, for example, the date range for industrial heritage on the website of the Industrial Heritage Association of Ireland (IHAI) is given as the broader 'late 18th century to the

recent past'. This is of particular relevance to the LIHS, as one of its aims from its earliest stages was to include as broad a range of Longford 'places of work' as possible. As a result, a number of modern features such as post boxes, airfields and particularly Bord na Móna infrastructure dating to the mid- and late 20th century - many of which are of particular relevance and interest to local historical groups - have been included in the LIHS. Broadly speaking, however, in compiling the Survey, a chronological definition of 1750 to 1930 has been followed as it reflects both the primary period of industrialisation within County Longford, and the related development and printing of the primary sources used in compiling the Survey (i.e. cartographic sources from 1814 to 1914).

At this initial stage of the LIHS project, industrial features have been identified from documentary sources alone. Field inspection to assess individual sites forms a critical second part to the survey, and will hopefully follow on from this project. This reflects the crucial role played by the examination and identification of physical remains in any attempt to reconstruct and reinterpret the industrial past (e.g. Palmer & Neaverson 1998, 15). Given the historical range of the LIHS and its documentary scope, generations of change and development within the Longford landscape have inevitably led to the destruction of some of the sites and features identified within the survey. This should be borne in mind when planning any subsequent programmes of field inspection as while some material remains are often visible and important elements of the modern landscape of Longford, in other instances no surface traces survive (e.g. backfilled quarries or razed mills). These, in many cases, may only be exposed through archaeological excavations or other ground-penetrating methods.

Within the broad chronological definition of the subject matter of industrial heritage, the scope of what constitutes its different elements is generally defined through a series of categories (e.g. Hammond & McMahon 2002, 9; Rynne 1999, 3; IHAI website). These categories vary depending on the individual study, and often reflect the thematic interests of earlier methods of examining industrial remains. The very large numbers of categories considered as part of industrial archaeology reflect how the processes of industrialisation altered and expanded over time, and how more and more people were drawn into earning a living within those processes. This means that the field of study

of the industrial archaeologist can include such diverse phenomena as extractive, manufacturing and utility industries, transport and communications networks, service industries (banks, hospitals and cinemas), housing development, agriculture and fishing (e.g. Rynne 2006, 187-204, 435-448).

1.3. Aims and features of the LIHS project.

Given that the LIHS is designed only as an initial stage in the identification of Longford's industrial heritage, and as it is finite in nature, it does not attempt a comprehensive consideration of all of the categories listed above. Instead, the LIHS is aimed at creating an inventory of what may crudely be termed 'primary' industries associated with manufacturing and the establishment of industrial infrastructures (Rynne 1999, 3; also Hammond & McMahon 2002, 9). 'Secondary' industries therefore only feature incidentally in the survey, or where their existence is considered to be directly relevant to the existence of a related primary industrial feature. Following on from the definition of industrial heritage given above, the LIHS is, in effect, a survey of extractive industries, manufacturing industries, utility industries, and transport and communications dating from c.1750 to the present day. The remit of the survey was also formulated to include an assessment of the scope, extent, nature and historic development of these industries in County Longford, based on existing cartographic and historical sources, and on information contained within relevant statutory databases such as the Record of Monuments and Places.

In order to identify and process the information contained within the maps and documents consulted, the design stages of the LIHS involved the creation of a system to categorise industrial features, and the establishment of a computerised database in which to record and organise the features. The database was also deliberately constructed to allow the inclusion of further information for each site following field inspection at later stages in the project, and to allow the easy addition of any further sites that may be identified in the future. The computerised database is fully searchable, by location, type or name of site, so that the data can be accessed by the County Council, researchers, local heritage societies and the general public.

Another important factor taken into account at the onset of the project was the presence of previously existing industrial heritage surveys for other Irish counties. Earlier Industrial Heritage Surveys have been undertaken in County Louth by Fred Hammond, in County Dublin by Mary MacMahon, and in County Kildare by Giacometti, Duffy and Ní Cheallaigh. The Meath Industrial Heritage Project, also being conducted by the authors, is due for completion in 2009. An important aim of the LIHS project was therefore to ensure that it would be comparable, and compatible, with both previously existing and future industrial heritage surveys.

Despite this, the industrial heritage of County Longford can be seen as substantially different to that of other counties recently studied. As one of the most important industries in Longford in the past, as it remains today, is farming, the Project Steering Group felt it was important that sites which reflected agricultural industries (such as markets and creameries) would be included in the survey.

The database is accompanied by maps plotting the location of each of the 701 industrial sites identified. Grid co-ordinates for each of the identified sites have also been compiled as part of the Survey in order to allow the future production of an integrated Geographical Information System for Longford's industrial heritage. Due to the very large numbers of lime kilns and quarries, these sites have been treated in a separate manner, and they have not been included in the database, nor are individual grid co-ordinates for these supplied. Instead, the position of each such site has been noted from the First Edition of the Ordnance Survey (6-inch map) series (1836-7), and plotted on the maps to provide a distribution of lime kilns and quarries as they were represented on these mid-19th century sources.

1.4. Format of the Report.

The information presented in this report is divided into two parts, which are in turn broken into a number of sections.

1.4.1. *Part One.*

Part One of this report contains those sections in which the component parts and methodology of the LIHS desk-based study is described, and in which the strategies

governing its organisation and structure are outlined. Also included in this part of the report are brief descriptions of the categories developed to organize and classify the sites and features identified. Part One comprises Sections 1.0. to 4.0.

In Section 2.0, an account has been given of the methodology of the project, which includes a detailed explanation of the numbering system used throughout (Subsection 2.11) and of the cartographic presentation of the industrial sites (Subsection 2.12). This section also includes a description and analysis of the sources consulted, and of their significance to the overall project.

Section 3.0 comprises an explanation of the computerised database, its workings and its format. It is intended that this section of the report will function as a users' guide to the database, and it is further intended that it will be appended to the 'live' (internet-accessible) version of the databases by Longford Local Authorities. Its aim is to provide a basic outline of the conventions and terms used in the database, as well as explaining basic organizing concepts such as database fields, typographical conventions and abbreviations used.

Section 4.0 consists of a discussion of the main categories used to structure the LIHS, and the theories and understandings underpinning their identification. The nature of the cartographic representation of sites is also considered, as are the limitations of cartographic analysis in the context of the Survey.

1.4.2. *Part Two.*

Part Two of this report contains an overview and preliminary analysis of the raw data generated by the survey insofar as this relates to the industrial heritage of County Longford. It also outlines proposals for the structuring of future phases of work on the LIHS project. Part Two comprises Sections 5.0 to 12.0 of the report.

Sections 5.0 to 11.0 present some of the preliminary results of the desk-based element of the Survey, which have, for ease of reference, been broken down and presented in separate sections. The sequence and organisation of these sections corresponds to the five main organizing subcategories around which the LIHS has been structured (see

below). In each of these sections, brief summaries of the preliminary conclusions prompted by these results are discussed.

In Section 12.0, suggestions are made regarding possible future stages of activity that will take up where this preliminary desk-based stage of the LIHS has left off. These have been drawn-up based on the identification of research opportunities identified in the course of the desktop study, and on a critical assessment of its limitations.

The report includes a hardcopy version of the inventory of sites identified through the LIHS, together with copies of the maps on which the location and extent of sites are marked, in a separate volume.

2.0. METHODOLOGY.

2.1. Introduction: the database and record of sites.

The LIHS project methodology involved eight broad steps, which are individually described in Subsections 2.2 to 2.9 below. The system used to number individual sites, and the cartographic presentation of sites (including the maps used), is considered in Subsections 2.10 and 2.11 respectively. The eight steps can be listed as follows:

- 1). Establishment of site categories and database fields.
- 2). Setting-up of searchable computerised database.
- 3). Establishment of data set for initial identification.
- 4). Initial identification of industrial sites.
- 5). Further identification and database entry.
- 6). Cartographic presentation of industrial sites.
- 7). Detailed secondary analysis and archival research.
- 8). Establishment of grid references as basis for a future Geographical Information System (GIS).

2.2. Stage 1: Establishment of site categories and database fields.

The initial categories of sites to be included within the LIHS was discussed and decided at the initial meeting with the Project Steering Group in Longford Local Authorities on 19th June 2008. The categories chosen, while reflecting locally specific concerns and phenomena, were informed by recent published works on Ireland's industrial heritage, particularly Colin Rynne's (2006) magisterial and comprehensive book on the subject (and see also Rynne 1999, 3) and the publication by Hammond & McMahon (2002, 9) which suggests a methodology for the identification and recording of industrial sites in Ireland (and see also the website of The Industrial Heritage Association of Ireland (<http://www.ihai.ie>)).

Another important factor taken into account was the authors' previous experience in compiling the Kildare Industrial Archaeological Heritage Survey in 2007, which provided an insight into field categories that had proved effective from the perspective of a person searching the finalised database. Following on from that project, and as

noted above, it has been one of the guiding aims of this survey that its format, database and categories would allow useful comparison between it and the existing Dublin and Kildare Industrial Heritage Surveys. The distinctive nature of County Longford's industrial heritage has also been accommodated within the final categories and fields that form the basis of the LIHS inventory. These fields and categories were identified from preliminary surveys of the cartographic sources and other material and in consultation with the Project Steering Group.

As a result, seven broad categories were initially identified which allowed the features, monuments and sites to be grouped into coherent inter-related units according to function and practice. Due to the particular relevance of the peat industries to County Longford, it was decided to create an additional and separate category for peat alone, to cover sites and features associated with peat extraction, processing and power generation.

A decision was also taken to separate out mills and mill-related features from manufacturing sites. This was done in order to facilitate searches for (for example) all watermills or all windmills. Two final categories were created in order to allow the nature, number and extent public institutions (e.g. workhouses) and urban areas to be assessed. Although not themselves strictly industrial, these features generated considerable manufacturing, extractive and other activities and were often symptomatic of various forms of industrial activity in the wider area. They have, therefore, been included within the remit of this survey and have been recorded and cartographically identified. It should be noted that prisons have not been included in this survey, but could be added at a later stage of the project should evidence of significant industrial activity associated with them be identified.

It should also be noted that due to the very large number of extractive sites, lime kilns and small-scale quarries were treated in a different manner to other sites, and do not (with some exceptions) have corresponding database entries.

Thus, the structure of the survey comprises ten category headings, several of which overlap (refer Para 4.1 for further detail on these). The categories are:

- **Transport**
- **Health & Hygiene**
- **Communications**
- **Power**
- **Peat**
- **Extractive (with quarries and lime kilns dealt with separately)**
- **Manufacturing**
- **Mills**
- **Institutions**
- **Urban areas/other**

These broad headings were further subdivided in order to allow the differentiation between different forms of activity within the categories (e.g. the 'Transport' heading was broken down to include separate road, rail, canal, river and bridge categories). Within these different activities, specific site functions were also established so that individual features could be distinguished from each other (e.g. 'Transport' → 'Canal' → 'Canal lock'). The categories and types are explained and discussed in more detail in Section 4.0.

2.3. Stage 2: Setting-up of searchable computerised database.

The MS Access 2000 database designed to store and present the results of the survey is described in detail in Section 3.0. Its format and operations are similar to those used by other similar surveys, such as the Dublin Industrial Heritage Survey and Kildare Industrial Archaeological Heritage Survey, in that information was entered on computerised 'forms'. These forms included fields for all of the separate categories, subcategories and information requirements established in Stage 1 of the methodological process. Each form also includes a separate tab (presently blank) that is intended to provide space for information gathered during the later site-inspection and site evaluation stages of the survey. The database software also allows it to incorporate a range of digital information in addition to text, so that such items as scanned photographs and other images may be included in the inventory as part of future phases of survey.

As ease of searching ('searchability') was considered to be essential to the use of the database, initial database design stages involved experimenting with the formatting

and presentation of small numbers of feature entries in order to refine search processes. As a result, the database is searchable by location (townland, parish, town, OS Sheet No., etc.), function (e.g. bridges, transport features, mills, etc.) and site name.

2.4 Stage 3: Establishment of data set for initial identification.

In compiling the LIHS, the 6-inch (1:10,560 scale) Ordnance Survey (OS) maps of Longford would form the initial data set or primary sources for the survey, and in this the compilers were drawing on the experiences of Hammond and MacMahon (2002), the compilers of the Laois and Dublin Industrial Surveys. Overall, 97% of industrial sites in the LIHS (including the 701 sites in the database and the 2,841 quarries and lime kilns) were represented on the 6-inch OS maps.

In the coverage provided by the 6-inch maps of Longford, the county is divided into 27 map sheets, which form the basis for the numbering and organisation of the inventory (refer Fig. 1). Analysis of the chronologically sequential First, Second and Third Editions of these maps, supplemented by the Inventory and files of the Record of Monuments and Places (RMP; forming part of the archive of the National Monuments Section, Department of the Environment, Heritage and Local Government), led to the identification of the great majority of the industrial sites included in the survey.

The choice of the 6-inch maps was dictated by the fact that they represent a series of accurate 'snapshots' of the county on a field-by-field and townland-by-townland basis from the 1830s (First Edition of 1836-7) through to the 1910s, albeit reflecting the specific concerns of the surveyors. While the earliest edition of the maps included depictions of surviving industrial features from the later 18th century and before, successive revisions of the maps in 1879-82 (Second Edition), and in 1913-14 (Third Edition) also tracked their demolition and alteration, the construction of a range of 19th century industrial sites and places, and their alteration and destruction in turn. In some instances, particularly in the southeast of the county where 20th century Bórd na Móna railways needed to be identified, the map coverage was extended into the post-independence period, providing information on industrial developments after the 1920s.

The 'universal' geographical coverage of the maps and the fact that they record surviving 18th century elements (such as roads, mill, bridges, canals etc.) within the 19th and early 20th century landscape means that they are fundamental sources of information on the configuration of Longford within the time frame of Industrial Archaeology. The fact that they also track the survival or destruction of individual features over time means that they are a valuable tool in pinpointing the past location (and, therefore, the possible extent of subterranean remains) of industrial features and sites that have not survived into the present day.

2.5. Stage 4: Initial identification of industrial sites.

This stage of the project entailed the identification of industrial heritage sites from the primary data set (the OS cartographic sources as described in Stage 3). The identification of features was conducted systematically and was based on a close examination of the each of the 27 map sheets in the data set, beginning with Sheet 1 in the north of Longford, and ending with Sheet 27 in the southeast (refer Fig. 1).

At this stage it was decided to expand the analytical process beyond the bounds of the primary data set by analysing two further set of maps: the Ordnance Survey 25-inch (1: 2,500 scale) maps of the county (1911-1913), and the Discovery Series (1: 50,000 scale) maps (1996-8). Several reasons underpinned the decision to examine these two very different maps at this early stage in the survey. Firstly, the different scales of these two maps-facilitated the identification of industrial sites which were excluded because they were too small to be represented at the 6-inch scale, or that had not been explicitly labelled as industrial sites on the 6-inch sheets. The 25-inch OS maps were particularly useful for the identification of industrial features in larger towns, such as Longford, as the scale of the 6-inch maps generally precluded any detailed representation of industrial features within their dense fabric.

In addition, the much later date of the Discovery Series maps allowed the identification of 20th century industrial heritage features, notably Bórd na Móna peat-extraction and processing infrastructure. Finally, technological improvements in cartography (the Discovery Series maps are compiled from aerial photography) have led to the inclusion of additional information which was not recorded on earlier OS maps.

Each of the identified industrial sites was sequentially numbered, from top left (northwest) to bottom right (southeast), and marked on print-outs of the maps (refer Section 2.10 for a description of the numbering format). Basic information was recorded for each of the examined sites, including details regarding the location of features; their presence or absence on the First, Second and Third Editions of the 6-inch OS maps; details regarding their cartographic representation; the names of features where recorded; and the types of features involved.

From an early stage of the project, it became clear that the quantity of lime kilns and quarries (including sand and gravel pits) was such that individual descriptions and numbering of these features would be impossible within the timescale available for the desktop study. In addition, it was felt that the visual representation of these features in the same manner as other industrial heritage sites would severely affect the potential use of the database, due to the fact that in large parts of the county, lime kilns are marked on almost every farm. Therefore, it was decided to record the overall distribution of lime kilns and quarries cartographically using colour-coded symbols, and that these sites would only be numbered and given corresponding database entries if they were of particular interest. In addition, with the exception of specific larger-scale features, only the First Edition OS maps were used to identify lime kilns and quarries, and those marked on the second and Third Editions were not recorded. This was based partially on the scale and number of sites identified and the fact that the First Edition is the best source for lime kilns due to early 19th-century soil improvement practices (they appear only rarely on the early 20th-century Third Edition). The distribution maps of the lime kilns and quarries generated by the LIHS survey therefore represent a 'snapshot' of small-scale quarrying and lime processing activities in and around the 1830s rather than a comprehensive survey of all 19th century activity of this sort.

The following Ordnance Survey maps were consulted during this stage of the project:

- OS 1st Edition 6-inch (1:10,560) maps (1836-37) - 27 sheets.
- OS 2nd Edition 6-inch (1:10,560) maps (1879-1881) - 27 sheets.

- OS 3rd Edition 6-inch (1:10,560) maps (1913-1914) – 27 sheets.
- Ordnance Survey 25-inch (1:2,500) scale maps (1911-1913).
- Ordnance Survey Discovery Series (1:50,000) maps (1996-8) – 4 sheets.

2.6. Stage 5: Further identification and database entry.

Stage 5 involved consultation of additional sources, particularly previous surveys of industrial heritage, or surveys that contained features of industrial heritage interest. These additional resources were consulted in order to obtain further details on sites identified in Stage 4 (the cartographic survey), and also to identify sites that were not marked on the Ordnance Survey maps.

A number of existing national surveys contain information on County Longford industrial sites and features. Of these, the Record of Protected Structures (RPS) of the Longford Development Plan 2003-2009 contained a significant number of industrial features, including the listing of 'Mill Buildings of Industrial Archaeological Interest'. The National Civil Engineering Database, Trinity College Dublin, also provided useful information on a number of sites. Although the Record of Monument and Places (RMP) of the Archaeological Survey of Ireland was consulted, it contained few industrial sites and those that it listed were covered in more detail in other sources.

One of the more useful surveys was the Longford County section of the National Inventory of Architectural Heritage (NIAH), which was in the process of being edited during the compilation of the LIHS survey. The DoEHLG very kindly allowed us to access the lists and entries of the database which had been completed at the time of writing. This source was of particular value in identifying industrial heritage sites such as water pumps and post boxes that had not been cartographically depicted. A previous survey of industrial sites in County Longford by Courlander and Courlander (1976), entitled 'Preliminary Report on Industrial Archaeological Monuments in County Longford', also provided details of site inspections of known industrial sites.

The sources in question included pre-1830 maps which were compiled and published before the systematic surveys of the Ordnance Survey. They were examined as an initial step towards the establishment of rough dating sequences for the features, and

were particularly valuable in drawing out information on sites for which there was little or no historical information. They included the maps of the Commissioners of the Bogs of Ireland by Edgeworth and Townsend (1810-1813), Taylor and Skinner's *Maps of the Roads of Ireland* (1777), maps of the Survey of the Manor of Granard by John Brownrigg (1795), and William Edgeworth's 'Map of the County of Longford...' (1814). Analysis of these maps led to the identification of numerous additional sites and features, particularly watermills, that had been destroyed before the compilation of the First Edition 6-inch sheets.

Longford County is particularly fortunate in that both the Valuation Office Mill Book (1835-40) and Sir Richard Griffith's Primary Valuation of Tenements (1854) survive. Information from these documents has been extracted and reproduced in W. Hogg's (2000) *Mills: The Millers and The Mills of Ireland of About 1850*, including additional details on sites and, interestingly, a number of mill sites which had not been marked on the Ordnance Survey maps.

A survey of the bridges of County Longford was completed in 2007 (McLoughlin 2007) for Longford Local Authorities. This survey identified and recorded 418 bridges of industrial heritage interest in the County, and the information generated by the survey was extremely useful in the compilation of the LIHS.

Summaries of all licensed archaeological excavations carried out in the Republic of Ireland between 1970 and 2004 are available online at www.excavations.ie and in printed form as the *Excavations Bulletin* series edited by Isabel Bennett. Of those excavations that were carried out in Longford, three involved industrial features such as corn mills, corn kilns or saw mills.

The brief accounts of Longford parishes and towns which were compiled as part of Lewis' (1837) *Topographical Dictionary of Ireland* were also invaluable sources of information on potentially unidentified sites. They were particularly easy to access and search as they have been gathered together in an extremely useful online version by the Ordnance Survey of Ireland.

As part of their web resources, Longford County Library (www.longfordlibrary.ie) have made the Ordnance Survey *Field Name Books* of the 1830s available to researchers online. This source proved extremely useful in identifying a range of sites and features, particularly a significant number of local smithies, which were otherwise unrecorded or difficult to identify on the various county maps.

The following comprises a summary list of the sources referred to above (full details of the non-map sources is provided in the bibliography):

18th and early 19th century maps.

- Maps of the bogs of Ireland, Districts Nos. 6, 7 and 15, appendices from ‘Report from the Commissioners of the Bogs of Ireland’, 1810-1813, by Richard. L. Edgeworth and Thomas Townsend.
- A Survey of the Manor of Granard, 1795, by John Brownrigg.
- Maps of the Roads of Ireland, 1777, by Taylor and Skinner.
- A Map of the County of Longford...’, 1813/4, by William Edgeworth.

Existing surveys of industrial sites in Longford.

- National Inventory of Architectural Heritage of Longford.
- Record of Protected Structures (RPS) and Mill buildings of interest (LCDP 2003-9, Ts. 5.1 & 5.2).
- Proposed additions to RPS in Draft Longford County Development Plan 2008.
- Local Action Plans produced from 2004-2008.
- Record of Monument and Places (RMP) (DoEHLG c.1996).
- National Civil Engineering Database, Trinity College Dublin.
- Preliminary Report on Industrial Archaeological Monuments in County Longford (Courlander & Courlander 1976).
- Valuation Office Mill Book for Co. Longford, 1835-40 (Hogg 2000, 87-8).
- Sir Richard Griffith’s Primary Valuation of Tenements, 1854 (Hogg 2000, 343-8).
- The Bridges of County Longford: An Inventory of Civil Engineering Heritage (McLoughlin 2007).

General historical reference.

- Lewis, S. 1837 A Topographical Dictionary of Ireland. Lewis & Co.: London.
- Ordnance Survey *Field Name Books for County Longford*, compiled c. 1836. Online version made available by Longford County Library.

By the end of this stage of the project, all of the industrial sites to be included in the LIHS had been identified, and basic locational, descriptive and dating records had been produced for each site. These records were entered into the computerised project database, and at the same time the sites were categorised into the established categories and types, as previously described. As noted above, information on the county’s lime

kilns and quarries was recorded in cartographic form only, and has been superimposed on a geological map of the county for ease of analysis (refer Figs. 2 and 3).

2.7. Stage 6: Cartographic presentation of Industrial Heritage Sites.

Upon its identification, the location of each identified site was digitally marked on a copy of the relevant sheet of the Archaeological Constraint maps for County Longford. These maps were compiled in the 1980s and substantially revised and updated in the 1990s as part of a national archaeological inventory aimed at producing a comprehensive state-wide Sites and Monuments Record. They now form part of the archive of the Record of Monuments and Places (RMP), and in the case of Longford, are predominantly based on the Third Edition 6-inch sheets (1913-14) of the county. They were chosen for use as part of the LIHS project as they provide a quick and convenient way to visually cross-reference Longford's industrial heritage with the location and occurrence of other earlier and less specialised archaeological remains within the county.

In order to distinguish between sites, each (with the exception of lime kilns and small quarries) has been assigned a unique number, marked on the map and entered into the searchable database in a way that reflects the established practice of the RMP and of other surveys. Where the exact location of a site is not known, a dashed line is used to indicate its probable approximate location. Urban areas that include numerous sites of industrial heritage are also marked, named and given individual site numbers. A detailed description of the numbering system is presented below (Subsection 2.10), and for more information on map formatting, see Subsection 2.11 and the maps in the accompanying separate volume. Both digital and paper copies of these maps have also been presented to Longford Local Authorities.

2.8. Stage 7: Detailed secondary analysis and archival research.

This stage of the project comprised an assessment of the presence of additional historical and documentary sources relating to the industrial sites identified in Stages 4 and 5 of the project. Some of this information had already been generated during Stage 5 (see Subsection 2.6), particularly where sites were mentioned by Lewis (1837). Where sites were identified through cartographic analysis only, or where they were not

individually named on various maps, further consultation of more specialised historical sources was often required in order to yield additional information about them.

This stage therefore comprised a focused search of internet and archival sources for appropriate material. Given the time constraints of the project and the scale of the analysis required in order to complete Stages 1 to 6, it was not possible to provide references for every site or feature identified. The references and historical information generated during this stage of the project should not, therefore be considered to be fully comprehensive, but should be used as starting points for further research on individual sites. Where possible, however, the location and full reference of relevant historical sources containing general or specific information regarding sites or features have been entered into the database. In relevant examples, the extent and potential of various archives and sources has been assessed.

General sources of information on Industrial Archaeology were also consulted at this stage in order to round-out some of the descriptions of sites in the database. References to some of the more common site types have been included in Section 4.0 of this report under 'Additional Information', and full citations for these and other general references used are to be found in the bibliography at the back of the report. In most instances, however, the more specific or specialised references of relevance to particular sites or features are recorded on the data forms of the computerised database.

2.9. Stage 9: Establishment of grid references as basis for a future Geographical Information System (GIS).

Grid Co-ordinates have been provided for each of the sites and have been listed in a separate Excel spreadsheet so that the data can easily be linked with mapping data in a GIS system. Grid references are given as twelve digits (in the format EEEEEENNNNNN) representing a location accurate to 10m, and are based on the Irish Grid system (1975). Irish Grid Co-ordinates have also been included in the MS Access 2000 database as part of the basic information given on each site.

2.10. Explanation of numbering system.

The numbering system used in the LIHS (where individual sites are given ‘Monument Numbers’) is based on existing systems already used in Ireland to inventory archaeological monuments. The most influential and coherent of these is the numbering framework of the Record of Monuments and Places, which has influenced the similarly-conceived numbering scheme of the Dublin Industrial Heritage Survey implemented by Dublin City Council. Both of these systems, like that of the LIHS, use OS 6-inch map sheet numbers as an organising principle.

The LIHS Site Number is a unique identifying number assigned to each site or place in the survey, and is presented in the format **LIHS-001-002--**. The first element of the code comprises the letter ‘L’ identifying the County (Longford) and IHS for ‘Industrial Heritage Survey’ as distinct from other forms of heritage. The next element (001 in the above example) gives the number of the Ordnance Survey 6-inch sheet on which the site is located. As the county is covered by 27 6-inch map sheets, the second element is always a number between 001 and 027. Three digits are used for consistency with existing systems.

The last element gives the number of the site or place within the sequence of different sites identified on the particular OS 6-inch sheet (so that the ‘002’ in the above example means that the site corresponds to the location or features marked ‘2’ in red on the relevant map). The final two dashes at the end allow related industrial features, or industrial sites situated in close proximity to each other in the dense fabric of towns to be given one overall site number, but at the same time to be individually identified. This is achieved by the use of sub-numbering within the overall site number. For example, the number LIHS-001-002 might denote a brewery complex, while LIHS-001-00201 might represent an individual malt house within the brewery complex; LIHS-001-00202, a warehouse within the complex, and so on. Each of these features, as well as the overall complexes within which they occur, have corresponding forms within the database.

The sub-numbering system is also particularly useful in the case of urban areas, for example Longford Town (LIHS-013-013--), where a large number of individual

industrial sites lie within a compact area. The sub-numbering system also enables additional sites to be added as they are identified, and enables changes of use or ownership to be tracked and cross-referenced by assigning a different sub-number to the different phases of a site's existence.

2.11. Format of maps.

The maps on which the industrial sites are shown are reduced copies of Ordnance Survey 6-inch maps (i.e. 1:10,560 scale), as used by the Record of Monuments and Places. These maps have been reproduced at a scale of approximately 1:25,000 for the LIHS project.

The sites identified as Recorded Monuments by the RMP are identifiable on the LIHS maps as black circles or as areas clearly delineated and numbered in black. In order to distinguish the industrial archaeological sites of the current project from those of the RMP, all sites identified as part of the LIHS have been circled or approximately outlined on the maps using thick red lines. They have also been numbered in red according to the system set out above, while the names of towns and villages have also been added to the map sheets for ease of reference. In a number of cases several sites have been outlined together because of their close proximity to, or association with, each other. It is important to note that although the circles and outlines around the LIHS sites are intended to indicate their relative positions, the circles and areas are not intended to define the exact extent of sites or any precise zones within which associated features might be found.

As noted above, a shortened version of the appropriate LIHS number as given in the database appears on the maps beside each circle or outline denoting a site or sites. The first elements of the LIHS number (the LIHS part and the number indicating the 6-inch sheet) have been omitted for reasons of space and simplicity. Thus, the first site marked on Sheet 1 will simply have the number 1 written in large red type beside it, rather than the full number LIHS-001-001.

Dashed red lines are used where the exact location of an industrial heritage site has not yet been ascertained, and only an approximate location is known.

On each of the 27 map sheets, lime kilns and quarries (for sand, gravel or stone) appear on the 1836-7 OS map are marked by coloured shapes: blue dots for lime kilns and green squares for quarries. The overall distribution of these is also marked on Figures 2 and 3.

3.0. THE DATABASE.

3.1. Introduction.

The survey database was set-up using MS Access 2000, and was designed with the aim of providing an easily usable format and allowing for maximum searchability. This section is intended as a basic guide to reading, searching and entering new information into the database. It is primarily intended for those unfamiliar with the MS Access software.

3.2. Reading the Database.

When the survey file 'LIHS' is opened a dialogue box with a number of options, in the left of the box, appears. This offers a choice of how the information contained within the database can be viewed and used. Of primary importance for reading information stored in the database are 'Forms' and 'Tables'.

3.2.1. *Form View.*

Form View is the most useful way to read and enter information on the database. In this view each entry within the survey is shown as a separate page or form, with a series of categories or 'fields' into which the information is entered. For the purposes of this survey the form was divided into three areas:

- (i) The top half of the form contains the basic information for the site (name, type, location, etc.). This is visible at all times and is considered as the primary information.
- (ii) The second half of the form is tabbed, with the upper tab containing all the information obtained from the desk-based survey. This involves analysis of a number of maps, information contained in other related surveys and other sources. It also contains some comments/analysis of sites, with possible dates suggested, and references to where further information can be obtained.
- (iii) The lower tab in the second half of the form is labelled 'Field Survey', and has been left blank for future completion.

The formatting of the primary information stored for each site is explained in tabular form below:

<i>Field Label</i>	<i>Comments</i>
Site No. LIHS-	This is broken into two separate fields (the 6-inch sheet no. and the unique site no. within that sheet), to increase searchability of the database.
LIHS Ref.	This is identical to the Site No. , but presented as one field, to allow searching for a specific site at a countywide level.
Site Name	The name listed for a site is generally as labelled on maps, or named in other sources. However, many sites were unnamed and in these cases rather than leaving the field blank the sites have been given generic names such as 'Mill' or 'Bridge'. This was solely to give an extra field for searches within the database.
Site Type	This contains the type of feature listed. Information within this field has been kept as brief as possible. However, in many cases the type had to be qualified, particularly in the case of uncertain sites where (possible) has been added after the type.
Same Site as LIHS-	This is generally of use for sites that extend across map sheets, e.g. canals and railways, and allows for a feature to be traced across the 6-inch maps.
Associated with	This contains the LIHS ref. no. for features related to the site in question. For example bridges crossing a railway, would contain the LIHS Ref. No. of the railway in the Associated with box.
Location	This is set at Co. Longford by default
Townland	Where a feature extends into/across two or more townlands these are separated by semi-colons. Where a feature is located on the boundary of two or more townlands this is indicated by '(junction)' after the townlands names. Townland spelling is based on the 3 rd Edition (1913-14) of the OS 6-inch maps.
Civil Parish	Multiple parishes are separated by semi-colons.
Barony	Multiple baronies are separated by semi-colons.
Address	This is primarily used for locating urban sites, or where a feature is located within demesne grounds.
Nat. Grid Ref.	Location of the feature on the Irish Grid system.
Point / Polygon	This relates to the Irish Grid Reference given. The point box is ticked where the co-ordinates refer to the centre point of a discrete site, e.g. a bridge. The polygon box is ticked where the co-ordinates refer to a single point on a linear site or one that extends over a larger area or has multiple features, e.g. canals, most mills, urban areas. Both boxes are left blank in cases where the exact location of a site is uncertain.
Classification	The function of the site by category is shown by tick-boxes. More than one category may be ticked.

The formatting of the information from the desk-based survey is as follows:

<i>Section</i>	<i>Comments</i>
Maps	The primary source of cartographic information were the first three editions of the Ordnance Survey (OS) 6-inch maps (c.1836-7; 1879-82 and 1913-14) and the 1 st Edition 25-inch map (1911-13). The most relevant historic maps are also listed. Presence or absence of a site is denoted by tick-boxes, and a short description of the depiction of the site on the relevant map is included. 'Other maps' contains the names of other, less relevant, historic maps or maps from other surveys. Further information regarding the appearance and labelling on these ' Other Maps ' is contained in the 'Comments' field.
Surveys	This contains information regarding the presence of the feature in other surveys, primarily the Record of Monuments and Places (RMP); the Record of Protected Structures (RPS), the National Inventory of Architectural Heritage (NIAH) and the Longford Bridge Survey (LBS).
References	This contains references of sources for information in the ' Comments ' and ' Additional Information ' fields.
Comments/ Estimated Date of Site	Containing some basic analysis of the information derived from the maps and from secondary research, descriptions of features as they appear on historic maps, and where possible a date
Additional Information	This field is used where information included is too lengthy to fit in the Comments or References fields.

To navigate around a form page use the scroll bars at the bottom and right-hand-side of the window. It should be noted that using the scroll-wheel on a mouse moves between pages in the database and cannot be used to navigate within a page. Where information for a field is not fully visible within a text-box, because it is too long for the text-box, clicking into the box will bring up an internal scroll-bar for that box, making it possible to scroll down and read all the information entered. In particular, this may occur where a feature passes through numerous townlands, which although all entered into the **Townland** text-box, may not be fully visible.

The total number of entries in the database is visible at the bottom of the window. This shows up relative to the entry opened in the form (e.g. 100 of 670). To move between pages of the database, use the 'forward' (▶) and 'back' (◀) symbols at the bottom of the page. The forward and back symbols with a line after/before them will bring up the last or first page of the database respectively. As mentioned above, the scroll-wheel on a mouse can also be used to move between pages in the database.

To enter a new site into the database in form view, click on the '▶★' button at the bottom of the window. This will bring up a blank form page into which information can then be entered. Click into a text-box in order to type data for that particular field. Clicking on a tick-box will create a '✓' in the box, clicking on it again will delete this.

To delete an entire record from the database, go to the form page for that record. Select 'Delete Record' from the Edit drop-down menu in the menu bar. A dialogue box will appear asking to confirm the deletion. Once confirmed the record is no longer in the database. Please note, this action cannot be undone.

3.2.2. *Table View.*

The database can also be viewed as a table. To open the database in Table View, click on the 'Tables' icon in the original dialogue box (see 3.2.1.). The file 'LIHS' should appear in the right-hand-side of the dialogue box. This is the database in the form of a table.

The amount of information stored for each entry in the database means that reading the database in table view is difficult and unwieldy. Likewise entering new data in table view may not be practical. For both of these form view would be the preferred option.

The columns in table view correspond with the fields visible in form view. The column 'Dbase ID' appears only in table view. This is an automatic identity number given to each entry and is used as a key by the database programme to recognise/identify a given entry.

The main advantage of viewing entries in table view rather than form view, is that a number of entries are visible at the same time, allowing for quick comparisons between sites. Both form and table views of the database can be sorted by a single field, in ascending or descending order, by selecting an entry in that field and clicking the 'sort ascending' (or 'sort descending') icon from the menu bar.

3.3 Searching the Database.

Simple searches can be carried out in either form or table view of the database, using the 'Find'; 'Filter by Selection' or 'Filter by Form' functions. These are explained below for form view, but are also applicable to table view.

The 'Find' function is most useful to find a specific entry. Although it can be used to search for a group of sites, it will automatically find the first entry, which matches the search. The search has to be repeated for each subsequent matching entry. As such, it does not allow for comparisons between sites and no information is given as to how many entries match the search.

To perform the find function in form view (using 'mill' as an example):

- Click into the text-box of the field to be searched (in our example click into the 'Site Type' box).
- Click the 'Find' icon in the menu bar (denoted by a pair of binoculars).
- A dialogue box appears. Enter the search data into the 'Find What' text-box. E.g. enter 'mill'.
- Choose 'Any Part of Field' from the drop-down menu for the 'Match' text-box at the bottom of the dialogue box. This allows for entries with multiple types, and also windmills. Note that searches are not case sensitive.
- Click 'Find Next'.
- The database will jump to the first entry in the database, which matches the search information. 'Find Next' must be clicked each time to find the next entry. If there are no matches a dialogue box with this information will appear.
- It is better to keep search information as simple and short as possible (using key words).

The 'Filter by Selection' function filters all entries matching a search from the database, presenting them as a sub-set of the database. In this way it is more useful than 'Find' for searching for a group or type of entries. It is however, necessary to first find an entry with the required search information. As a result it is more useful in table view than form view. In form view it would be necessary to first 'Find' a relevant entry before performing a 'Filter by Selection'.

Once again using 'mill' as an example, to perform a 'Filter by Selection' the following steps are required.

- Select the category to be filtered. Therefore to find mills, click into the text-box of Site Type containing the text 'Mill'.
- Click on the 'Filter by Selection' button in the menu bar. This is represented by a funnel and lightening bolt.
- All entries with 'Mill' in the **Site Type** field are filtered from the database. The total number of matches for the search is visible at the bottom of the window.
- To undo the filter and return to the main database, click the Filter button (represented by a funnel) in the menu bar.
- The main disadvantage with Filter by Selection is that it finds exact matches only. Therefore, in our example, entries with 'Mill (possible)' or 'Windmill' in the **Site Type** field will not show up in the filter results.

The 'Filter by Form' function is more versatile than the other two search functions. Like 'Filter by Selection' the results are presented as a sub-set of the database, with the total number of matches visible at the bottom of the window. It also allows for multiple information to be searched and contains an 'or' function. To perform a 'Filter by Form' search in form view:

- Click on the 'Filter by Form' button on the menu bar (represented by a funnel with a form page). This brings up a blank form page (however, if a previous filter was carried out the information for this may still appear and should be deleted before carrying out a new search).
- Type the information for the search into the appropriate field. Using an asterisk (*) before and after the search word acts similar to the 'Any part of field' in the Find function, and increases the success of a search. It is recommended this be always used. Thus to search for mills, enter ***mill*** into the **Site Type** text box.
- Click the 'Filter' button in the menu bar (represented by a funnel).

- All entries matching the search information are presented as a sub-set of the database. This sub-set can then be further searched by any of the search functions above.
- To undo the filter and return to the main database, click the Filter button (represented by a funnel) in the menu bar.
- More precise searches can also be made. For example, to find all mills associated with the textile industry, enter ‘*mill*’ into the **Site Type** text box and tick the ‘**Textile/Leather**’ box in the **Classification** section. Clicking the Filter button then produces a sub-set of all mills classified as textile mills.
- In form view, at the bottom of the search form is a tab labelled ‘or’. Clicking on this produces a second search form, to allow for wider searches.

3.4. Queries.

Queries provide another way of searching the database. The main advantage of queries is that they are saved as sub-databases within the overall database. They are also versatile, and the number of fields viewed in a query can be controlled. Queries are particularly useful to store commonly used searches, or to store versions of the database with less fields, which are easier to read in table view (and example of this latter is the stored query ‘LIHS List’ already on the database).

Queries open in table view and can be searched in the same way as the overall database in table view. As queries are linked to the database, any information altered/entered into the database is automatically altered/entered into saved queries.

To create a query:

- Choose ‘Queries’ in the original database dialogue box (see 3.2.1.).
- From the right-hand-side of the dialogue box double-click ‘Create Query in Design View’.
- A new dialogue box appears called ‘Show Table’. This allows for a choice of what table/set of information is used for the query. Both full database tables and query tables can be queried. To query the main database select the Table ‘LIHS’ and click ‘Add’.

- Click 'Close'.
- A box resembling a short blank table is visible in the window. At the top left-hand-corner of this is a small menu box listing all the fields in the chosen table. Double-click each field that is to appear in the query. The fields will then appear in the short table. Include as a minimum all the basic information fields, and those fields specific to the query. It is possible to include all the database fields in a query, although this is usually unnecessary.
- For example, in a query for mills, it may be useful to include the 'Manufacturing' set of Classification fields and the basic map information and NIAH information, but those fields with lengthy amounts of information may be omitted.
- It is also possible to include a field in a query for search purposes but hide it on the query results. To do this, un-tick the 'Show' cell for the relevant field.
- To specify the information required in the query, use the row labelled 'Criteria'. For example to query mills, enter **"*mill"** in the Criteria cell for **Site Type**. Note that the asterisks perform the same function here as in Filter by Form.
- As with the Filter by Form, more specific queries can be undertaken by entering criteria to be met in more than one field, e.g. To query mills which appear on Edgeworth's map of 1814, enter **"*mill"** in Site Type and **'yes'** in the Criteria cell for **Wm Edgeworth 1814**. (Fields with tick boxes recognise 'yes' and 'no' for query criteria).
- As with the Filter by Form, queries have an 'or' row for Criteria, so broader queries can be carried out.
- To view the query results simply click the Datasheet View button (with a Table icon, located at the left-hand side of the menu bar). This brings up the query as a table.
- The query can then be saved.
- To alter a query, click on the View button again (this time with a ruler icon denoting 'Design View'). This brings up the design view of the query and the information contained in the query can be altered.

3.5. Reports.

Reports are the printable views of the database, displaying the information in a more reader friendly way. As they are intended primarily for printing, they lack the search functions of the other views of the database. However, as with other views of the

database, any changes made to the database are automatically up-dated in a report. Therefore, once a report is created it is not necessary to manually update it at any point.

A report has been created as part of the initial stages of the survey, namely 'LIHS List', which contains the basic information for the sites within the database, presented in columnar form. The printed version of this report is included with this report.

4.0. DISCUSSION OF SITE TYPES, SOURCES AND LIMITATIONS.

4.1. Introduction.

As noted in Subsection 2.2 above, a number of basic categories of industrial site were defined from the outset of the study. These included ten main categories, which were in turn divided into a range of sub-categories in order to enable the organisation and comparison of data generated from cartographic and historic sources. These categories are:

- **Transport**
 - Road
 - Rail
 - Canal
 - River
 - Bridge

- **Extractive**
 - Quarry
 - Mine
 - Lime kiln
 - Other

- **Health & Hygiene**
 - Water
 - Waste
 - Other

- **Communications**
 - Postal
 - Telephone
 - Telegraph
 - Other

- **Power**
 - Gas
 - Water
 - Electricity

- **Peat**
 - Extraction
 - Processing
 - Other

- **Manufacturing**
 - Food
 - Drink
 - Building materials & timber
 - Textiles & leather
 - Metal
 - Chemical
 - Other
 - Unidentified

- **Mills**
 - Windmill
 - Watermill

-Millrace/millpond
-Other features

- **Institution.**
- **Urban Area, and Other.**

The following sections comprise brief descriptions of each of the site types identified within the categories listed in terms of their representation on cartographic sources. Within these descriptions, consideration is given to the roles played by different sources and changing mapping conventions in the identification of the different site types. Where sources other than maps were also used to identify sites, these are described, while the limitations of the Survey (and possible resulting biases) will also be addressed within each subsection. Additional sources and references that give further information on each of the site types have been listed in individual entries in the database itself, and these are also repeated below. A more analytical consideration of each of the site types can be found in Section 5.0, which outlines some of the results and conclusions drawn from the compilation of the Survey.

4.2. Transport-related sites.

Industrial sites recorded under the broad category of transport were subdivided into five sub-categories: railways, canals, roads, rivers and bridges. Many of the bridge sites fell under multiple categories, for example a road bridge crossing the canal was entered under each of the categories 'canal', 'road' and 'bridge'. A road bridge crossing a named river (named on the Ordnance Survey maps) was recorded as being in the category of 'river' as well as 'road' and 'bridge', whilst one crossing an un-named stream or millrace was simply categorised as 'road' and 'bridge'. This enables the cross-referencing and comparison of similar sites and features that were constructed for different purposes, and also allows the numbers of particular site types to be estimated. It is also hoped that the multiple categorisation of site types will facilitate future specialised or site type-based studies based on the data generated by the survey.

4.2.1. *Roads.*

Roads were generally not separately included as individual sites within the survey. However, a range of road-related features such as coach-houses were listed, while some of the accounts of road bridges contain incidental information on the construction or configuration of individual stretches of road.

4.2.2. *Bridges.*

Bridges were the most numerous transport-related sites to be identified in the course of compiling the survey. Identified examples included road and foot-bridges that spanned rivers, streams, canals and railways. The criteria for including a bridge in the LIHS was that it had been named in the cartographic or historical sources, and/or crossed a named river, and/or previously recorded as a Protected Structure, in the National Inventory of Architectural Heritage (NIAH) or the Record of Monuments and Places (RMP). These criteria have resulted in the inclusion of all major bridges over rivers, minor named bridges, unnamed bridges over significant rivers, and bridges crossing canals (which are all named, and which are often recorded in the NIAH). This approach has ensured that almost all structurally significant or historically recorded bridges have been included within the survey. Less common, but also present in significant numbers, were rail bridges which crossed roads, canals, rivers and streams, and which were always included even though these are rarely named. The decision to exclude unnamed crossings of roads over minor streams or drainage ditches was taken on the basis of the impossibility of cartographically distinguishing between bridges, informal culverts and culvert pipes at these points. It also reflects the impossibility of adequately recording the extremely large numbers of these features within the time limits and scope of the survey project. Many of these minor bridges are, however, recorded in the Longford Bridge Survey (McLoughlin 2007).

Bridges are generally marked on all three editions of the OS maps by strengthening or adding bold lines along the edges of a road at the point at which it spans a channel or body of water. Larger bridges are shown with angular piers, the number of which often does not correspond with the actual number of arches. Bridges are, in general, more likely to be named on the second and especially Third Editions of the 6-inch sheets. Railway bridges, given their origins in the railway-building decades of the

1840s to c. 1880s, are, of course, only marked on the second and third 6-inch map editions (post 1850s).

Some major bridges over rivers are marked on earlier historic maps from the 17th and 18th centuries, particularly if those bridges lie at county boundaries or on major regional or national routeways. Canal bridges only occur on those maps of Longford that were compiled following the extension of the canal network into the county in the second half of the 18th century. Where the names of bridges are marked on 18th century maps, these names are almost always the same as the names by which the bridges are known at present (with one or two exceptions). Although bridges of all types are rarely mentioned in the historical sources, they are well represented in the NIAH. One of the bridges (Lanesborough Bridge) is a Recorded Monument. Overall, therefore, the most useful source of information on the bridges of Longford in general is the Third Edition 6-inch OS map (c. 1907-9). Consultation of O’Keeffe and Simington’s (1991) *Irish Stone Bridges* is also recommended as the majority of the bridges identified (with the exception of the railway bridges) are likely to have been built of stone.

4.2.3. *Railways.*

Railway tracks, stations and associated features (station buildings, level crossings, bridges, goods sheds, etc.) are clearly depicted and labelled on the Second and Third Editions of the OS 6-inch maps, and absent on earlier sources. The tracks themselves, comprising track corridor and tracks, are generally represented as two or four parallel lines, often flanked by hachures indicating cuts or embankments and by further lines denoting the presence of adjacent drains. Railways constructed after the 1930s, such as the Bórd na Móna railways in the east and southeast of the county, are not marked on the Second and Third Edition 6-inch sheets maps and, for information on these, Johnson (1997) and the OS Discovery Series 1996-8 maps have been consulted. Railway stations and railway bridges are also often listed in the NIAH, but were not recorded as part of the Record of Monuments and Places.

There are a number of additional references for the railway lines and other railway features of County Longford. These have been entered into the relevant entry in the LIHS database where appropriate and include a number of general books on railways

(Baker 1995; Hajducki 1974; Johnson 1997; Mulligan 1990; O'Farrell 1990; Share 2006). Further specialised publications on the Midland & Great Western Railway (Shepard 1994)) are of relevance to the railways of Longford, as this branch crossed the county and formed the basis of the present rail network. Bog railways and quarry railways for industrial use are discussed by Johnson (1997).

4.2.4. *Canals.*

Canals and associated features (locks, bridges, aqueducts, canal-supply streams, harbours, lock-houses, etc.) are labelled and depicted on all three editions of the OS 6-inch sheets. Canal channels are usually represented by two or four parallel lines, occasionally flanked along their external edges by hachures denoting embankments and by further parallel lines denoting networks of drains. Details such as tow-paths, locks and canal-supply streams are depicted in more detail on the First Edition than on later 6-inch maps. This is probably due to the fact that canals lost some of their importance following the establishment of the rail network, and also because the expansion and resulting mapping of an urban areas often obscured the clear labelling of features on canals. Locks are usually depicted by a '>>' symbol (denoting the presence of two sets of lock gates) but are rarely named. Lock houses can usually be identified by their proximity to a lock, but are rarely labelled specifically. In terms of non-cartographic sources, the NIAH is an excellent source of information on canal-related features, and lists and describes many of the canal sites cited in the LIHS in the database. The NIAH is particularly useful in that it also lists canal-related warehouses that are generally not marked on the OS 6-inch Maps.

There are a number of additional references to sources of information on canals in County Longford, and these have been entered into the relevant entries in the LIHS database where appropriate. These include general books on waterways (Coyne 1902a), and books on the Royal Canal (Clarke 1992; Delany 1992). The Inland Waterways Association of Ireland website (www.iwai.ie) is also an excellent source of general, historical and other information on the canals. The National Library also includes photographic images from the Irish canal systems among its archives.

4.3. Extractive industries.

4.3.1. *Quarries.*

Quarries account for the vast number of extractive sites in the survey, and indeed they are the second most most common industrial feature in Longford, only exceeded in numbers by lime kilns. As noted above (with the exception of named quarries or quarries of particular historical or industrial interest) only quarries on the First Edition map were recorded by the LIHS, and these have not been assigned individual numbers, nor have they been given individual LIHS entries (refer Fig. 3).

The First Edition 6-inch OS map explicitly differentiates between quarries, sand-pits and gravel-pits in the legend and key accompanying its sheets, however in practice the difference between a sand-pit (shown by an area of thin dots) and a gravel-pit (slightly thicker dots) is difficult to distinguish because of the relatively small scale of the map. Stone or other types of quarries are generally depicted as rocky hollows, but at times very small quarries are difficult to identify. Fortunately, almost all quarries are clearly labelled on the First Edition map.

Those wishing to further investigate the occurrence of quarries on the First Edition 6-inch map of Longford should also note that the National Library of Ireland's microfiche copies of this map are particularly difficult to use, as numerous minor blemishes on the microfiche surfaces look identical to quarries. For this reason these were not used in the survey. In addition, the marking of parish boundaries by a thick green line can obscure fainter features, although this is not a problem when the quarries are labelled.

Large scale and historically important quarrying operations were included in the survey, and these appear both on later cartographic and in publications (e.g. Johnson 1997 on quarry-railways). In addition, one residential site associated with quarrying was included on the basis that it had been highlighted by the NIAH as being of industrial heritage interest. Additional sources of information on 19th century quarrying in general were also examined (Kinahan 1889; Rynne 2006).

4.3.2. *Lime kilns.*

Although theoretically a manufacturing/processing feature rather than an extractive one, lime kilns were considered under the heading of extractive industries because of

their strong association with extractive sites, and because they were treated (due to their ubiquity) in the same manner as quarries. Thus, as noted above (with the exception of lime kilns considered to be of special interest) only lime kilns on the First Edition map were recorded by the LIHS, and these have not been assigned individual numbers, nor have they been given individual LIHS entries (refer Fig. 2).

Lime kilns are depicted on the First and Second Edition OS 6-inch maps as a small circle with the lower portion shaded in. They are not depicted on the Third Edition 6-inch map, although they do appear infrequently on the c. 1910 edition of the 25-inch OS map as small square structures labelled 'L.K.'. Unsurprisingly, lime kilns are often associated with quarries, although this relationship is not as strongly marked as it was in other counties (e.g. Kildare). It is of interest, given the fact that they are the single most common built industrial site type in Longford, that they are almost absent from the historical literature. This is likely to reflect not only the relatively modest importance generally assigned to them as built structures, but also their frequent association with agriculture (where burnt lime was to neutralise acidity in soils), the poor 'visibility' and isolated occurrence of their physical remains, and their limited survival.

4.3.3. *Mines, brickworks and other extractive industrial sites.*

Mines and tile/brickworks are depicted relatively rarely on the cartographic sources, but do occasionally appear. No specific cartographic symbols were used to depict mines on the Ordnance Survey maps, and the existence of such features instead tended to be indicated by text labels (for example 'pits'). The same is true of tile- or brickworks, brickyards, and tile or brick kilns, which include both the extraction and processing of clay to make bricks and tiles. Although scattered mines and brick or tile works are occasionally marked on all three Editions of the 6-inch OS maps, and also on the 25-inch OS sheets, such sites do not appear on other cartographic sources.

4.4. Health and Hygiene.

4.4.1. *Water.*

Water services were recorded in the LIHS where they were considered to be of potential industrial heritage value or where they were likely to have involved the

application of significant industrial engineering technologies. For this reason, the LIHS database contains information on water pumps and hydrants, and hydraulic rams. Given their small scale, most of the information on water pumps and hydrants in the LIHS derives from the recording of such features in the NIAH survey. The identification of hydraulic rams, by contrast, was primarily based on their depiction on the Third Edition 6-inch OS sheets. Water towers, where cartographically depicted, were also included in the Survey and a proportion of the entries concerning these structures also include information generated by their inclusion in the NIAH.

4.4.2. *Waste.*

Cast iron sewerage vents considered by the NIAH to be of engineering and/or architectural value have been included in the LIHS. No waste-related sites were identified from cartographic sources.

4.5. Communications.

4.5.1. *Post.*

Post offices and post boxes were recorded in by the LIHS. As a significant part of the impetus for the improvement of the road infrastructure came from the burgeoning national postal service, early post offices marked on the First, Second and Third Edition 6-inch maps have been given LIHS numbers. Additionally, cast-iron post boxes listed by the NIAH and considered to be of engineering and/or architectural value have also been included.

4.5.2. *Telephone and telegraph.*

Although no sites directly relating to telephone or telegraph use were recorded in the LIHS, Edgeworthstown House does have a relationship with the development of the telegraph system in the country, and has therefore been included in the survey.

4.6. Power.

Power Stations were generally not marked on the OS maps as most of them were constructed in the decades following the 1940s. However, some early gas works

buildings do appear on cartographic sources, and these have been included in the LIHS. It should be noted that these sites are under-represented in the LIHS. Peat-powered power stations are dealt with separately below.

4.7. Peat.

As many of the features and sites associated with the industrial processing of peat in County Longford date to the later 1930s and thereafter, they are generally under-represented in the Survey. However, in order to redress this issue, and given the historical importance of the peat industries to the county, the recent OS Discovery Series maps of Longford (1:50,000) were examined for peat-related industrial features. This resulted in the incorporation of a number of peat railways and tramways and power stations marked on the map in the Survey. Additionally, historical sources, particularly Johnson's (1997) work on bog railways, proved invaluable in adding to the cartographically-derived information. The NIAH also records some peat-related infrastructural remains, usually in the form of level crossings, and these have also been included in the survey.

4.8. Manufacturing industries and mills.

4.8.1. *Mills and cereal processing.*

Two types of mill were included in the survey: watermills and windmills (note that steam mills would also have been included had any been identified, however none were; this is also the case with horse-mills). These are marked on all of the cartographic sources, including all three editions of the 6-inch Ordnance Survey maps and the early 19th century sources (with a range spanning from c. 1814 to 1914), and they are well represented in the documentary sources and previous surveys (e.g. Courlander & Courlander 1976; Hogg 2000).

Windmills are shown as small circular buildings and are generally labelled 'Windmill', or if dismantled 'Windmill stump'.

On the OS maps, watermills are generally depicted as T-shaped or L-shaped buildings associated with or situated adjacent to a range of water sources (most frequently streams, canals or millraces). They are in most cases labelled 'Mill' (and sometimes

'corn-mill', 'tuck-mill', 'saw-mill', etc.). The existence and location of ruined watermills was also often indicated through the position of text labels denoting their 'ruined' or 'disused' status next to depictions of any surviving remains.

On the pre-OS cartographic sources watermills are always depicted with a symbol of a toothed mill-wheel, and are usually simply labelled as 'mill'. It is interesting to note that this symbol is rarely explained in any of the keys for the maps, and presumably the cartographer assumes his reader will find it self-explanatory. Windmills are less prevalent than watermills and are depicted on pre-OS maps using small windmill symbols consisting of triangles or cones topped by four or more triangular sails, and are rarely labelled.

Watermills are often associated with millraces and millponds, and these are marked and usually labelled on the OS, but not on earlier maps. These features have generally not been given separate LIHS numbers as they are considered to form intrinsic parts of the related mills. In some cases, the presence of a mill has been inferred from the depiction of millraces and millponds alone, and in the absence of any associated buildings, these features have been given their own separate LIHS numbers. Often, smaller square or circular structures nearby were labelled separately as 'Corn Kilns' or 'Corn Drying Kilns'. These have been given separate LIHS numbers, as they are occasionally found alone without an associated mill.

The NIAH is a good source for watermills that have survived to the present day, and provides photographs and descriptions of identified and recorded features. In many cases, it provides a 19th century date for mill buildings which are marked on 18th century maps, suggesting that many of the mills were reconstructed in the 19th century, or were older than assumed by the NIAH compilers. One mill structure (Elfeet Windmill) was a Recorded Monument.

In the majority of cases where mills were identified, the specific functions of individual mills were marked on the OS or other maps. However, in other instances a specific function could not be assigned. In the sites of the LIHS, where function could be assigned, it was usually associated with the processing of food (with a high incidence of

corn and flour mills) or textiles (e.g. tuck mills), although saw-mills were also occasionally marked, particularly on later 19th century OS maps. The majority of watermills and windmills marked on the pre-OS 18th century maps, and on the First Edition 6-inch OS map of Longford are likely to have been involved in the processing of cereals.

A further source used in identifying mills for the LIHS was Sir Richard Griffith's 'Primary Valuation of Tenements' (1854) and the 'Valuation Office Mill Book' (1835-40.), both of which list numerous mills (including their owners and functions) from that time. These have been listed by Hogg (2000) in his book *The millers and the mills of Ireland of About 1850*, and accounts generated using these sources has also been supplemented by information gathered from the Ordnance Survey Memoirs of Longford County (1820-40). On the whole, therefore, mills (and in particular watermills for the production of flour) are very well represented in cartographic and documentary sources for Longford.

4.8.2. *Breweries and distilleries.*

Breweries and distilleries, rare in Longford, are generally marked on the First, Second and Third Editions of the 6-inch OS maps, often as large buildings or complexes of buildings near water sources in urban areas. They are generally labelled as 'distillery' or 'brewery' on the OS Maps, but tend not to be depicted on pre-OS cartographic sources. Information on entire brewery complexes, as well as on individual surviving features or structures, also appear in the NIAH survey.

4.8.3. *Textile and leather manufacturing.*

Unlike Counties Dublin and Kildare, only a single textile-processing complex in Longford (The Ballymahon Woollen Mills) was identified in Longford which could be called a 'factory' or 'manufactory'. Such labels generally imply textile processing on a larger scale than that of textile mills. Textile-manufacturing sites in general were rarely cartographically depicted prior to the compilation of the OS maps, and as a result the preponderance of sites identified in the Survey are of 19th century date. These sites are labelled as 'Bleach Mill', 'Wool mill', 'Tuck Mill' or 'Flax mill', and are depicted in the same manner as corn mills.

Where they occur, tanneries (leather manufacturing sites) are depicted as large yards partially surrounded by ranges of buildings, marked 'tannery' on the 6-inch OS maps. Tanneries have a tendency to be situated on the outskirts of larger urban areas, presumably on account of the distinctive smells associated with the industry. They are generally not recorded in other sources. Individual tanning pits, which might be indicative of smaller-scale leather manufacture, are not, however, depicted on any of the cartographic sources examined.

4.8.4. *Smithies and metalworking sites.*

Smithies and forges are frequently depicted on the Third and Revised Edition 6-inch OS maps (c. 1913-14) and on the c. 1912 edition of the 25-inch map of Longford. They are generally depicted as small rectangular buildings fronting onto a main road and labelled 'Smy.' or 'Smithy'. The First and Second Editions of the OS 6-inch maps indicated the use of a small horseshoe symbol on a roadway to denote smithies, however in practice these are very difficult to spot, and in some cases to distinguish from trees and other small features, and possibly as a result only very few symbols of this type were identified on the actual maps themselves. This has led to a situation where very few smithies of 19th century date or earlier have been identified on either the First or Second OS 6-inch maps, or on any of the pre-OS cartographic sources. This phenomenon was previously noted during the compilation of the Kildare Industrial Archaeology Heritage Survey, where not a single smithy was identified from the First and Second Edition maps.

Given the pre-automobile era dependence on horses for transport and motive power, including the use of horses to tow barges along the canal, it is very unlikely that so few forges or smithies existed in the county before the 1880s. In order to rectify this imbalance, other non-cartographic sources were consulted, notably the OS place name notes and the NIAH. However, the smithies listed in the place name notes can be difficult to locate as they are listed by townland only, and those on the NIAH are generally of 20th century date. The resulting situation is that any smithies in use during the 19th century, and disused by the beginning of the 20th century or before, do not feature in the LIHS.

No larger metalworking sites such as iron-works or foundries were identified in Longford during the compilation of the survey.

4.8.5. *Building materials and timber manufacturing.*

Other than brick and tile works (considered under the Extractive heading above), the only other identified site types relating to the manufacture of building materials (other than lime kilns and brick fields, which have been considered under the 'Extractive Industries' heading), were saw mills. These appear only on the Third Edition OS map and in several cases have been converted from corn mills.

4.8.6. *Factories.*

No factories or larger-scale manufactories were identified in the course of compiling the survey from cartographic sources. This is partially due to the fact that most buildings or complexes identified as factories came into existence in Longford later in the 20th century. A number of modern factories mentioned in the Draft Longford County Development Plan as important local employers were included.

It is important to note, therefore, that the picture of County Longford manufactories and factories presented in the survey is far from comprehensive. Given that factories generally postdate the compilation of the maps used in the Survey, it is likely that many of the more prominent or locally significant examples in Longford are not represented in the database. Furthermore, as modern factory buildings are not generally considered to be of architectural value, they are unlikely to appear in NIAH or Protected Structure surveys, which might otherwise be expected to pick up some sites missed during the primary and secondary analysis stages of the LIHS.

4.9. Urban Areas, and other industrial features.

Eighteen urban areas were identified during the survey (and are listed in Section 11.0). This category included both genuine urban centres such as Longford Town, and also smaller villages, which have a concentration of industrial sites. While a considerable

number of these towns and villages contained sites and features of industrial interest that have been included in the LIHS, other industrial sites lying within their bounds have not been recorded as part of the Survey. This has generally occurred where sites or features were established in the decades following the 1940s or where sites were not represented or individually labelled on cartographic sources. While the under-representation of sites in urban areas is to be expected on the relatively small-scale 6-inch maps, examination of the larger scale Third Edition 25-inch sheets showed that industrial sites were equally likely to be unlabelled at this scale. Once again, however, the consultation of historical sources (e.g. Lewis 1837) enabled the identification of additional sites not marked on the cartographic sources and their inclusion in the Survey. Moreover, consultation of the Local Area Plans, which have been produced for approximately half of the urban areas identified, allowed the recording of additional industrial sites. It was recognised very early on in the LIHS that further work focussing on urban areas will very likely lead to the identification of even more industrial sites of interest, and thus almost all of the towns and villages have been given LIHS numbers, even where they yielded no cartographic evidence of industrial functions.

A number of industrial features which have not been discussed in the preceding sections, and which were generally associated with urban areas, were also listed in the LIHS. These included workhouses, creameries, abattoirs and market-houses, which involved either primary processing activities or the use within them of potentially significant industrial technologies. Laundries and bakeries were not identified in County Longford, although these must have existed. As with many of the more straightforward urban industrial features, these miscellaneous sites appear only sporadically on cartographic sources and are not always labelled. They are, therefore, likely to be under-represented in the Survey.

4.10. Relevance of sources to LIHS.

As noted in the preceding sections, the relevance of particular sources to the LIHS is dependent on the type of industrial feature and reflects changing map conventions, so that for example the First and Second Editions of the 6-inch OS maps are best for the identification of lime kilns whilst the Third Edition 6-inch OS map is the most relevant for the identification of smithies. Some overall conclusions can, however, be drawn

regarding the relevance of consulted sources to the LIHS study as a whole. In the table below, the number of identified LIHS sites that appear on the main sources is listed. The total number of sites in the LIHS database is 701 (while a further 2,842 quarries and lime kilns have also been identified).

Source	Number of sites	% of total.
First Edition OS 6-inch map	409 (3,250 inc*)	58% (91% inc *)
Second Edition OS 6-inch map	351	50%
Third Edition OS 6-inch map	429	61%
c. 1910 Edition OS 25-inch map	444	63%
All Editions OS maps	598 (3,439 inc*)	85% (97% inc*)
Edgeworth's County Map	184	26%
Courlander & Courlander	59	8%
Record of Monument and Places	3 (excluding historic towns)	-
NIAH database	207	30%
Protected Structures, LLA	25 (2003-9 plan only)	4%
Valuation Office	22	3%
Griffiths Valuation	64	9%
OS Field Name books	49	7%
Longford Bridge Survey	110	16%

[* including lime kilns and quarries]

It is clear that no one single source could have been used alone to compile the LIHS, however the sites identified on the combined editions of the 6-inch OS maps, constituting 85% of the sites in the LIHS database (and 97% of all identified sites including lime kilns and quarries), demonstrate that these were the primary source for industrial features in Longford. The few 18th century maps examined in the course of the study tended to include watermills, windmills and major bridges only, perhaps reflecting the compilation biases of the maps, and in a number of cases sites that were not marked on the OS maps were identified through these sources. The NIAH and LBS surveys were of particular use as these included a field inspection, which provided significant additional information. The NIAH listed a large number of sites (especially post boxes) that could not have been identified on the OS maps. The Record of Monuments and Places was the least relevant source for the LIHS, with only three industrial sites (a windmill and two bridges) specifically mentioned.

PART TWO: OVERVIEW AND PRELIMINARY ANALYSIS OF LIHS DATA

5.0. INTRODUCTION.

5.1. Structure of the overview.

This and the following sections of the report constitute an overview and preliminary presentation of some of the patterns of information that have emerged in the course of compiling the desk-based element of the LIHS. A detailed analysis of the data has not been attempted, and it must be repeated that the industrial sites identified at this stage of the Survey are primarily those depicted on the cartographic sources examined. It is likely that further stages of analysis (such as field inspection and further historical research) will lead to the identification of additional sites and the generation of further information that may alter some of the conclusions outlined below. This section should therefore be understood as a very general introduction to the large amounts of raw data generated by the Survey insofar as these relate to the main industrial features encountered, their occurrence and their geographic location.

In presenting the data, the basic subdivision of the material into broad categories has been followed, and (as was the case in previous sections) the sub-categories and headings included under each have been individually considered. Each of the categories has been considered in a separate section for ease of reference, so that transport-related information is presented in Section 6.0, extractive and building materials in Section 7.0, services and utilities in Section 8.0, peat in Section 9.0, manufacturing and mill features in Section 10.0, and information on urban areas and miscellaneous sites in Section 11.0.

It should further be noted that the numbers of sites represented in each of these basic categories vary, and a number of sites were entered as having more than one category. Thus for example, in the table below the 85 windmill and watermill sites were also recorded as being part of the 296 manufacturing sites. Due to the very large number of lime kilns and quarries identified on the First Edition OS maps, which, representing

over 80% of the total sites identified, skew the results of the survey, the percentages given on the table below are based on the 701 sites identified within the LIHS and entered into the database.

Categories	No. of sites	Percent of Total (exc*)
Transport	227	32%
Extractive (excluding peat)	14 (2,855 inc*)	2% (81% inc*)
Power (excluding peat)	6	1%
Peat	10	1%
Health & water	42	6%
Postal	66	9%
Manufacturing	296	42%
Windmills/watermills	85	12%
Urban Area/Institution/Other.	35	5%

[* the 2,841 lime kilns and quarries]

5.2. Broad Geographic Patterns.

Industrial features were not evenly distributed throughout Longford. The county can be divided into four broad areas in terms of their number and nature of industrial heritage features (refer Fig. 4). These areas are based loosely on the Landscape Character Assessment of County Longford (in the Draft Longford County Development Plan 2008).

5.2.2. *Central Corridor, including Cloondara and Granard.*

The central corridor area of Longford is situated in the northern-central portion of the county, running from the west to the north-east of County Longford. This area includes most of the larger urban centres in the county, and also contains Longford's main administrative centres. The towns of Newtownforbes, Longford and Granard are nodal points in the county's present road transport network, whilst the former two and Newtownforbes are all situated along the N4 road from Dublin to Sligo, a route which is of great importance and antiquity (Doran 2004). The MGWR Railway also runs through this region, and the town of Cloondara (or Clondra) acts as a nodal point in terms of the inland waterways communication system, situated as it is at the point where the Royal Canal terminates and joins with the Shannon River. One further crucial transport corridor is the Camlin River, which flows through the centre of this region, and was a crucial factor in encouraging industrial development.

This corridor of urban centres and transport routes in the centre of Longford acted as a major generator of industry in the area, represented by the large numbers and variety of industrial features identified here. Concentrations of sites are found in proximity to

these towns, which also act as local centres for specialist manufacturing industries, and along the important transport arteries. In addition, the Camlin River and its tributaries provided power for the densest distribution of textile and saw mills. This area also had a significant concentration of lime kilns, and a particularly high density of quarries that were concentrated around Granard and Ballinalee (refer Fig. 3).

5.2.3. *Peatlands and Shannon Basin/Lough Ree.*

The southwestern quadrant of Longford has the lowest quantity and density of industrial sites, as well as the lowest number of urban areas. Industrial features in this area are dominated by the canal system. The dominant industry in this relatively un-industrial part of the county was large-scale peat working and extraction. The canal played a dual role in this respect, as it enabled the drainage of large areas of bog while simultaneously acting as a transport network linking these with road and rail networks and urban markets. The peat industry has had a huge impact in this region, particularly after the foundation of Bord na Móna in the mid 20th century, and is centred on the town of Lanesborough on the River Shannon. The heightened importance of peat-working in this part of the county also reflects the historical failure of other forms of industrial endeavour in the region despite the opportunities provided by the improvements in transport infrastructure during the industrial period. This area had the lowest number of watermills, which was due primarily to the lack of suitable water flow, but it also contained two of the four windmills identified in the Survey.

5.2.4. *Northern Upland and Drumlin Lakeland.*

The northern third of the county is characterised by a particularly heavy concentration of quarries and lime kilns, especially the latter (refer Fig. 2). This is largely due to geological and geomorphological factors, but may also have been a product of poor quality agricultural land, and the resulting need for farmers to supplement farm incomes by small-scale quarrying. This region, and the large numbers of quarries that it contains, are discussed in greater detail below (Subsection 8.2). Although the region is not served by any of the main road, rail or canal transport networks, it is criss-crossed with a large number of small country roads, and in addition to extractive industries this region also contained a large number and variety of industrial heritage features such as smithies and post offices.

5.2.5. *Open Agricultural and Inny Basin.*

The southeastern quadrant of the county is distinguished by the large numbers and varied types of industrial sites distributed evenly across its landscape. In a similar manner to the Central Corridor, the density of industrial sites increases with proximity to urban centres, the largest of which in this area is the town of Ballymahon, which acted as a focal point for road and water (in the form of the Inny River and the Royal Canal) transport networks, which were all of vital importance to the industrial development of this part of Longford. The area is distinguished from the Central Corridor area by the significantly lower proportion of lime kilns and quarries, which may reflect the better soils of this area.

6.0. PRELIMINARY ANALYSIS OF TRANSPORT INFRASTRUCTURE DATA.

6.1. Introduction.

The dramatic improvement in the transport infrastructure that took place from the 18th century onwards provided a crucial impetus towards the industrialisation of County Longford. Infrastructural improvements have been divided into three main types that broadly follow a chronological sequence from the upgrading and extension of the road network from the mid-18th century, through the establishment and decline of the canal network between the later 18th to mid 19th centuries, to the establishment of the rail network in the mid 19th century. River transport was also important, particularly during the period of main use of the canals. Just under one third of the industrial features in the LIHS (excluding quarries and lime kilns) were related to transport infrastructure.

6.2. Road transport.

Road transport in Longford was greatly improved as a consequence of the establishment and implementation of the Turnpike Road system from the earlier 18th century onwards. The system, which was aimed at upgrading transport links throughout the island of Ireland as a whole, involved a piecemeal series of road improvements by levying tolls on travellers. These tolls were collected at a series of toll-barriers or 'turn-pikes' along the roads, which had often been improved on an individual basis by local landowners or authorities. The improved road network extended in all directions from Dublin to the rest of the country, with the result that the main 18th century turnpike road leading towards the northwest of the county led to Longford Town (the present day N4) and Lanesborough, on the route to Roscommon, by a second branch from Mullingar which also passed through Ballymahon (the present day R392). Both these roads are notable for their extreme straightness over large parts of county Longford, and for the fact that they do not deviate around topographical features. The Dublin - Longford route had been established from an early date, and was one of the most important routes in the medieval road system, the *Sligh Assail* (Doran 2004).

The turnpike system was implemented within the county between *c.* 1730 and 1750 (Broderick 2002, 36-43), and consisted of widening, straightening and resurfacing existing medieval and later medieval roads. In some areas, new roads were built in conjunction with the systematic construction and upgrading of permanent and wider bridges over the county's waterways. These roads were further improved between 1789 and 1819 at the behest of the newly established Post Office Mail Service (Broderick 2002, 120-131), as good roads were necessary to accommodate its fast horse-drawn coaches. In this regard, the career of Richard Lovell Edgeworth is of particular note, as he was responsible for the early 19th-century introduction of modern road building techniques in the vicinity of Edgeworthstown (as early, if not earlier than, the better known McAdam of tarmacadam fame), and indeed his residence at Edgeworthstown House has been included in the survey as a location of importance to the industrial heritage of the county (LIHS-015-00607).

The 18th century also saw the empowerment of Grand Juries in the construction and upkeep of roads at a local level (Rynne 2006, 312). These Juries were the predecessors of the present County Council system and were largely comprised of wealthy landowners within each county (*ibid.*, 311; 314). Despite legislation to prevent 'abuses in the system' (*ibid.*, 312) many of the most notable road improvements that can be identified on the early Ordnance Survey maps are located in the vicinity of the larger estates.

The programme of later 18th-century road improvement is very clearly reflected in the industrial landscape of Co Longford. The routes of the turnpike roads through Longford are well-documented (Broderick 2002). While the primary existing roads follow the courses established by the turnpike system, very few traces of the turnpikes themselves survive. The erection of milestones, indicating distances from Dublin, was also carried out as part of the road improvement schemes, but none were recorded in this survey. The smithies of the 18th and 19th centuries can also be understood in terms of road-related industry, as they catered for the large numbers of horses and wheeled vehicles that transported people, goods and canal-barges throughout the county.

The sites of five 19th century coach-stations have been recorded in the Survey. One was situated in the centre of Longford Town (coach yard LIHS-013-01307), close to the Dublin Road, previously known as Turnpike Road (and recorded as LIHS-013-01306). A second coach station (LIHS-014-014) was situated further east along the main turnpike road (N4), and whilst marked on Edgeworth's map of 1814, it is absent on later 19th century cartographic sources. A 19th century horse-coaching inn was also noted along the Mullingar-Lanesborough road (LIHS-022-017), as was a coach house in Ardagh, associated with Ardagh House (LIHS-019-00704). Finally, a coach station was identified at Toome Bridge on the Royal Canal, at which 'passengers alighted ... to catch the Bianconi coach to Athlone' (Buchanan et al 2004).

6.3. Bridges.

As successive episodes of resurfacing and re-edging have obliterated many of physical traces of the road improvement works of the mid- to late- 18th century, the bridges of Longford have come to comprise the primary surviving records of those programmes. In fact, bridges in general comprise the most common transport-related site-type recorded in the survey as a whole, numbering 140 sites (which is just under a third of the total number of transport-related sites). The most common types of bridge identified are road and foot-bridges spanning rivers, streams, canals and railways. While most of the bridges included within the survey comprise road bridges of masonry construction, a number of footbridges and tow-path bridges crossing canals were also recorded. The survey also identified and recorded a number of mid- to later 19th century rail bridges, which crossed existing networks of roads, canals, rivers and streams. These are, however, less numerous than their road-related counterparts, as fewer of them were built, and as some unnamed examples were not included in the LIHS.

A large number of bridges were replaced in the mid 19th century, and some in the 20th century, probably due in part to improved techniques (for example, the use of longer spans to minimise the area that can be eroded by the river; Rynne 2006, 328), and in part to deal with increased traffic using the bridges.

Although a significant number of surviving bridges appear to date to the later 18th century, many of these were constructed at established crossing points and where bridge-widening rather than reconstruction occurred, may incorporate elements of earlier 17th century or medieval bridges. Of particular note here are Lanesborough Bridge and Abbeyshrule Bridge, both known 17th century crossing points and both listed as Recorded Monuments in the RMP. Indeed, part of the earlier bridge at Abbeyshrule still survives, to the north of the present bridge (Longford Bridge Survey, ref. N 2259-329). In many instances, therefore, while an 18th century date may be implied by cartographic and other evidence, further field inspection will be required in order to identify dates and sequences of construction or demolition at particular bridges.

Once built, many of the 18th- and later road-bridges were named to reflect prominent local individuals and/or those who had financially contributed to their construction. While in some rare cases bridge names have changed or become corrupted over the past three centuries, (for example the 19th century Arched Bridge crossing the Royal Canal became the 20th century Archie's Bridge, LIHS-026-00102), the majority of bridge names, where recorded, appear to have remained constant from the 18th century onwards.

6.4. The Royal Canal.

The establishment of the canal network from the mid-18th century has left Longford with some of its best known and most loved industrial heritage monuments. The Royal Canal runs through the southern and western part of the county, and was constructed between 1790 and 1817 in order to connect the River Liffey at Dublin to the River Shannon at Cloondara in County Longford. In the course of this journey, it passes through the towns of Abbeyshrule and Cloondara, whose development during the 19th century was shaped by the presence of the canal. The Longford Branch of the Royal Canal is a relatively short spur of the canal, which was built approximately a decade after the main canal opened (c. 1825), and which served Longford Town. A total of 87 canal-related sites were identified in the LIHS, which constitutes 38% of the transport-related features.

In addition to the Longford branch of the Royal Canal and the Royal Canal proper, numerous other canal-related sites have been identified during the compilation of the LIHS. The most common of these are masonry canal bridges and locks, many of which survive in good condition today and are generally maintained by the Waterways Ireland Section of the Office of Public Works. 35 canal bridges were identified, most of them located at points where roads crossed the canal, but occasionally accommodation bridges where tow-paths crossed the canal were also constructed. All of these bridges were individually named, with the exception of one tow-path bridge in Lyneen townland (LIHS-018-00907). Where locks are cartographically associated with small isolated structures on or near the canal bank, these are in many cases likely to be Lock Keeper's Houses. In total, nine locks (Locks 38 to 46, & Cloondara Lock) were identified, as were the nine associated lock-houses.

One of the most dramatic of the canal-related monuments in Longford, the Whitworth Aqueduct (LIHS-023-01213) was included in the survey. The large five-arch aqueduct was constructed in 1814-17, and to this day carries the Royal Canal over the Camlin River near Abbeyshrule. Monuments such as this are impressive and memorable reminders of the remarkable engineering achievements of the canal engineers and their workforces. Other canal-related engineering works are far less visible, for example the canal overflow channel (LIHS-022-01006) at Mosstown Harbour, near Keenagh, which may have facilitated the feeding the Mosstown Mills.

As barges, goods and passenger traffic tended to converge on larger towns and villages, localised widening of the canal channel were often constructed. These wider areas, or harbours, were also constructed for similar reasons at the termini of the various canal branches. A total of eight canal harbours were noted in the survey, most of which still survive, with the exception of Longford Harbour (LIHS-013-01301). Systems of associated cuts and spurs of channels were also built to form dry docks in which barges could be maintained and repaired, as occurred at Cloondara (LIHS-013-00311). The route of the canals through the villages of Longford provided an excellent opportunity to transport bulky goods efficiently to Dublin and elsewhere. This is reflected in the warehouses and stores lining the canal at Tennialick (LIHS-023-01209) and Cartronboy (LIHS-026-00101).

Canal barges were initially towed by horses, and horse-changing stations were occasionally constructed along the canal banks. An early 19th century horse-changing station near Newtown Bridge (LIHS-018-01004), which was the first such station for canal barges leaving Longford Harbour, and the only such station identified in the county by the Survey. Canal passenger ticket offices were identified at Longford Town (LIHS-013-01330) and Ballybranigan (LIHS-027-00101), just north of Ballymahon. The Royal Canal Parcel Office at Toome (LIHS-027-00103) was also recorded, as were other canal company offices in Longford (LIHS-013-01303) and Cloondara (LIHS-013-00313).

The canal system fell into a steep decline in the railway age. The last passenger boat was withdrawn from the Grand Canal in 1852, and in 1960 it was closed for trade. All of the branches were officially closed to navigation the following year. Despite this, the influence of the canals in generating industrial activity in parts of Longford cannot be overstated. They were of critical importance not only for the transport of bulk goods and creation of canal-based services along their routes, but also for less obvious reasons such as the drainage of bogs allowing the peat industry to develop and permitting the reclamation and improvement agricultural land.

6.5. Rail transport.

Longford is traversed by two branches of the Midland Great Western Railway (MGWR). The Mullingar to Sligo branch of the MGWR (LIHS-013-012; 015-004; 014-001; 008-014; 020-009; 004-005) ran approximately along the route of the N4 road, and was opened in 1855 (Johnson 1997, 89). The Cavan Town (via Inny Junction) branch (LIHS-016-003; 011-007) of the railway was opened in 1856 and closed in 1960 (*ibid.*). A total of 36 railway-related industrial sites (including the industrial railways associated with peat working) were identified, constituting 16% of all transport-related features.

As well as the railway tracks themselves, numerous railway-related sites have been included in the survey. The most common of these are the railway stations and railway bridges, but other features such as level crossings and associated gate-keepers' cottages (e.g. LIHS-020-00904), railworkers' houses (LIHS-014-00101), goods sheds (LIHS-008-01403) and railway offices (LIHS-013-01303) were also identified.

The Sligo branch of the MGWR served three main towns, each of which had a railway station: Longford Town (LIHS-013-01208), Edgeworthstown/Mostrim (LIHS-020-00901) and Newtownforbes (LIHS-008-01405). Railway stations were a focus of industrial activity, and are often associated with other features. For example Longford Town Station includes the main mid-19th century station building itself, as well as goods sheds, a crane, engine houses, a turntable, signal boxes, cattle pens, and a foot bridge.

Of particular interest at Longford Town are the two hydraulic pump houses (LIHS-013-01206) to either side of the tracks, of which the southernmost still survives, located just to the west of a drawbridge (LIHS-013-01205) which allowed the MGWR Rail track to cross the Royal Canal Longford Branch. This bridge is now demolished, but it appears to have been powered by the pump houses using the Canal water. A total of 15 rail bridges were noted, mostly comprising road-crossings, however two river crossings (LIHS-013-01202 and -020-00903) were noted as well as the canal crossing at Longford Town. Just over half of these had been previously identified by the Longford Bridge Survey (McCoughlan 2007).

Smaller railways were also included in the survey. These include the narrow-gauge Bord na Móna railways (see below under peat working Section 7.0) and quarry railway sidings (see below under extractive industries Section 7.2).

6.6. River transport.

The Shannon River, which runs down the western side of Longford County, has historically provided one of the most important transport routes into the centre of the country, and this route retained its importance in the industrial era, particularly following the completion of the Royal Canal. In the mid-18th century, a programme of works was conducted along the Shannon to improve its navigability, overseen by the Engineer Thomas Omer and the Commissioners of Inland Navigation. These works included the erection during the 1750s of beehive-shaped navigation markers, which are marked as 'beacons' on the OS maps. At least one of these (LIHS-012-001) survives in Knappoge townland, and has been recorded by the NIAH.

A second beacon that marked the confluence of the Shannon and Camlin rivers has also been recorded (LIHS-008-010). The Camlin River was also an important inland navigation route, and a 650m part of the river to the north of Cloondara was canalised to bypass the town, perhaps on account of the numerous mills on that stretch of the river. Although it was not commercially successful, this stretch of canal (LIHS-013-002) is regarded as 'a testament to mid-eighteenth-century entrepreneurial endeavour and engineering skills' (NIAH). Associated with it is a lock, lock house and the Shannon Navigation Office (LIHS-013-00203).

Following the passing of the Shannon Navigation Act in 1839, the Shannon Commissioners embarked on an ambitious scheme to upgrade its navigation so that it could be used by steam boats. The lock at Lanesborough was subsequently removed and the old bridge at Lanesborough replaced in the 1840s by the Shannon Commissioners (Buchanan *et al* 2004). Four harbours were recorded on the Shannon waterways, the largest and most important being at Lanesborough (LIHS-017-00105), but smaller harbours, for example Barley Harbour (LIHS-025-002) on Lough Ree were also noted.

7.0. PRELIMINARY ANALYSIS OF DATA RELATING TO EXTRACTIVE INDUSTRIES & THE PROCESSING OF BUILDING MATERIALS.

7.1. Introduction.

The extractive and building materials processing industries in Longford are represented in this survey by brick and tile works, saw mills, mines, lime kilns, quarries, gravel and sand pits, as well as rail and residential sites associated with the extractive industries. The extraction of peat is dealt with separately below (Section 9.0). A total of 2,862 sites associated with the extractive and building material processing/manufacturing industries were identified, constituting over 80% of the total number of sites in the LIHS. These are dominated by the 501 small-scale quarries and 2,343 lime kilns.

The development of the extractive industries in Longford was hugely dependent on improvements in transport infrastructure, particularly the canals, which from the later 18th century allowed the cheap transportation of heavy raw materials to elsewhere in the country. As the canals facilitated the extractive industries, demand rose at the end of the 18th century, with large civic street paving projects being undertaken in Dublin, and new shipping laws passed requiring stores of ballast at ports (Rynne 2006, 150-1). The extractive sites identified in this survey are overwhelmingly 19th century in date, however some of the larger complexes remained in use into the 20th century (e.g. Ballywillin Ballast Pit, LIHS-012-00802).

This pattern of small quarries, lime kilns and other extraction-related sites spread throughout the landscape is in marked contrast to the distribution of industrial features in more urbanised counties such as Belfast or Dublin, in which industrial features are either located in urban centres or along transport routes. This pattern, however, is representative of the distribution of industrial sites in County Longford as whole, and it is a rural one. The distribution of extractive sites suggests small-scale quarrying and building material processing by individual farmers throughout the county as a means of augmenting agricultural incomes from farmland, an option that became available following the significant improvements in transport infrastructure from the late 18th century. Thus in most ways the extractive industries in Longford County are strongly

related to rural and agricultural developments, rather than the more traditional view of urban-based industrial development.

7.2. Quarries, sand pits and gravel pits.

Quarry pits (for stone, sand or gravel) are the second-most common industrial feature in the survey, with just over 500 (14% of all sites) identified from the First Edition Ordnance maps alone, and they are consistently marked on every Ordnance Survey map sheet throughout the county. Due to the constraints of the project, only those quarries, sand- and gravel-pits marked on the First Edition OS 6-inch sheets were recorded, and the distribution of these features thus gives a 'snapshot' of early-mid 19th century quarrying activity in the County (refer Fig. 3).

The quarries identified varied widely in size and shape, in marked contrast to the quarries identified in county Kildare which were broadly uniform in morphology and scale. The quarries are also located in a relatively consistent manner with respect to the local topography, usually at the edges or corners of fields, on or near higher ground or low rises. A further pattern noted is the location of many quarry pits at townland, parish and barony boundaries. In many cases small tracks lead from the quarries to the main road.

The distribution of the early and mid-19th century quarry pits, shows that these features are situated overwhelmingly in the northern half of the county (refer Fig. 3). If one were to draw a line which follows the N4 in the east, and in the west runs just south of Longford and Cloondara, lands to the south of the line would contain a low density of quarries, whilst lands to the north would contain a moderate density.

The most intense concentration of quarries in the county is located in a band around, and slightly to the south of, the towns of Ballinalee and Granard (refer Fig. 3). The absence of any mention of extensive quarrying in this area by contemporary sources (e.g. Lewis 1837, who does, however, mention small-scale quarrying here), suggests that these quarries reflect *ad hoc* industry. It is possible that the quarrying was undertaken for or by large numbers of local tenant farmers acting in unison or under

the direction of a local landlord or substantial tenant. These may also reflect the activities of a local individual or individuals who rented the quarries from landowners and tenants and worked with them either simultaneously, or one by one. The sheer numbers of these small pits do, however, suggest that quarried material was being sold at a regional as well as at a local level.

It is interesting to note that this dense band of quarries does not correspond to any obvious topographical or geological feature. The bedrock in this area of highest density comprises Silurian Metasediments and Volcanics around Granard, but further west and south is dominated by Dinantian Upper Impure Limestones (Geological Survey of Ireland). Other factors, such as local farming practices and practical factors relating to the extracting the material may also have determined the high concentration of quarries in this area, as the same types of rock are also present over much of central and eastern Longford. With the exception of the area around Granard, this dense belt of quarries tends to avoid the higher ground to the north and south. The most interesting aspect of this dense quarry concentration in the Balinalee/Granard area is the apparent lack of adequate transport infrastructure, such as canal and rail networks, which one generally associates with developed quarrying centres.

Lewis' 19th century parish notes mention that limestone was extensively quarried in Longford, primarily for agricultural use (see Section 7.3 on lime kilns below), with the better-quality limestone used for building. He highlights several areas specifically, including Granard (Lewis 1837, 669). Lewis also mentions a 'freestone flag quarry' in Creeve Parish (*ibid.* 150), a good source of slate which was never quarried in Columbkille Parish (*ibid.* 443), a 'black stone quarry' at the county border near Abbeyshrule (*ibid.* 23), and a red marble quarry at Cartron near Westmeath (*ibid.* 443). Unfortunately, none of these individual sites could be identified in the LIHS survey.

Although most of the quarry features noted in the Survey are small in scale (and this is partially due to the absence of later 20th century maps consulted during the Survey, refer Section 4.3.1. above), one larger quarrying operation was included. This was Ballywillin Ballast Pit, also called Derryard Gravel Pit (LIHS-011-00802), which is depicted on all three editions of the OS maps with numerous associated structures. The

early 19th century road which led from the quarry was replaced by a mile-long railway sidings (LIHS-011-00801) by the turn of the 20th century, and these closed down in 1915 (Johnson 1997). This railway sidings connected with the main MGWR Railway line, and allowed the gravel quarried at Derryard Hill to be transported north to Cavan or south to Mullingar and Dublin.

7.3. Lime kilns.

Lime kilns show a different distribution to quarries, although once again they are concentrated in the northern part of County Longford, and are sometimes situated in close proximity to a quarry or group of quarries, thus probably representing lime processing near to the site of extraction (refer Fig. 2). Like quarries, they are usually situated at the edges or corners of fields and connected by paths to the main road. Rynne (2006, 157) remarks that ‘...the lime kiln [is] Ireland’s most numerous and widely distributed industrial monument’, and indeed this is the case in this survey, during which a total of 2,340 lime kilns were identified, constituting 67% of all industrial sites in the LIHS. Lime kilns were usually small flared pit ovens constructed from masonry with domed roofs, in which limestone was ‘calcined’ or heated to produce quicklime, which had a variety of uses. Most lime kilns were ‘intermittent use’ kilns, which meant that they had to be cleaned out after each operation (Rynne 2006, 157). Larger ‘continuous-use’ lime kilns which could be operated without requiring cleaning out were also constructed from the later 18th century.

The main uses for quicklime were for laying on fields in order to neutralise overly-acidic soils, or forming the basis for a lime-based mortar by ‘slaking’ the quicklime in pits of water. Very large quantities of lime were used as fertiliser in Ireland, particularly during the period 1800-1840 (Walsh *et al.* 1957, 105-6), partially to counteract natural acidity in the soil. Other uses included the manufacture of soda, and the removal of hair from hides for tanning. While the primary uses of lime may, therefore, have been in agricultural or construction contexts, the variations in production scale and the existence of other uses meant that a range of processing features were erected on sites. This is true for the processing of building materials as a whole, and the physical remains associated with extractive sites can be very varied.

Lime kilns are overwhelmingly concentrated in the northern third of the county. Broadly speaking, 75% of the quarries are situated north of a line that runs from Drumlish in the west, through Killoe and Granard, to Abbeylara (refer Fig. 2). This distribution appears to correlate almost exactly with the underlying geology of the area, which in the northern third of Longford comprises Ordovician Metasediments (shale, sandstone, basalt and rhyolite; Geological Survey of Ireland), bedrock types whose weathered products in the regolith tend towards acidic pedological conditions. It is interesting to note that the area of highest lime kiln density is quite separate from the area of highest quarry density; and furthermore, whilst the quarries are concentrated in an area of limestone geology, the lime kilns are heavily concentrated in the only part of County Longford where limestone is absent. This may reflect the widespread processing of lime at site of use rather than extraction. Quicklime is highly corrosive, making it difficult to transport over distances (Palmer & Neaverson 1998, 54) thus the lime kilns would be located in an area of more acidic soil where the quicklime was required.

Lime kilns occasionally survive today, and three 19th century (1820-1870) examples at least are still present in the County, and have been included in the LIHS database. These are a lime kiln at Aghnagore in a farmyard (LIHS-013-016), a lime kiln in the Old Deer Park of Mosstown Demesne (LIHS-022-012), and a lime kiln to the south of the stable yard in the Newcastle Estate (LIHS-027-012). These are large freestanding masonry structures, square in shape, and have been described and photographed by the NIAH. The fact that two out of these three kilns is situated in estate grounds does not reflect the original distribution of lime kilns, and is rather the result of the lack of 20th century developments in these large estate grounds, and perhaps of modern survey strategies, and also perhaps reflects the larger size of later lime kilns.

7.4. Mines.

Very few mines were identified from the survey. This may be due to the geological ground conditions in Longford, or the difficulty of differentiating a mine from a quarry on the cartographic sources. Rynne (2006, 129) mentions that 19th century mining in Ireland was widespread in rural areas and economically marginal, 'small-scale, sporadic [and] under capitalised', not unlike the quarrying described above. These

sorts of mining operations would not be distinguishable from quarries, and may not be marked, unless they were labelled on the cartographic source. 19th century writing mentions a number of potential mine sites, such as iron ore at Mohill (Lewis 1837, 374), and a coal vein at Mullawornia (*ibid.*, 145), however there is no evidence that these were ever worked.

The Cleenragh (or Cleenrah) Iron Mines (LIHS-003-007) to the west of Lough Gowna operated during the early and mid-19th century (Johnson 1997, No. 180; Lewis 1837, 310; Rynne 2006, 106;), and possibly from as early as the 16th century (NIAH entry). The mines are marked on the First and Second Ordnance Survey maps, and traces of the mine pits are still visible today. Iron ore from these mines was carted along the river to Lough Gowna, and from there transported by train to the Cavan Rail Line. A second mine was noted at Ardnacassagh, in the middle of the County, from Edgeworth's map of 1814, who notes an 'old silver mine' at this location (LIHS-014-002). The 19th and 20th century OS maps depicts the site as a 'quarry', and it is possible the mine had become disused at this time. The final mine-related site identified was a miner's house (LIHS-015-010) at Asnagh, near Granard, which has been recorded by the NIAH.

7.5. Brick and tile works.

Five sites associated with brick and tile manufacturing were identified in County Longford. The largest of these was a brickworks complex (LIHS-013-022) at Abbeycartron, to the northeast of Longford Town. This was a long-lived industrial site, which grew throughout the 19th century and was at its most extensive during the early 20th century, when it included a range building with nine brick kilns, two large clay extraction quarries, and the disused remnants of the previous centuries brick industries. The site is now demolished, replaced by a private residence called 'Brickfield House', but what appears to be the old tramway or trackway which led from the brickworks to the Mall is still visible today. A second smaller brickyard (LIHS-013-020) situated not far to the north at Cloonbalt was in use during the 19th century, and gone by the 20th century. At a brickyard, the topsoil is stripped and a clay-pit (or trench) is dug by hand. The clay is left out to sour, cleaned and watered, then fired on a clamp kiln to

make bricks, which became common in Ireland from the mid-18th century, although there use is recorded from the 16th century (Rynne 2006, 166-7).

A second set of brick-related sites were identified in and around Coolamber Manor Demesne to the east of the county. This comprised two circular brick kilns (LIHS-015-013 and -015-016), marked on the early 19th century OS maps, but not on later maps. It is possible that their situation in close proximity to a substantial prosperous house reflects the idea of individuals involved in generating industry, leading to a minor concentration of one activity in one area. Although no clay extraction sites or brick-fields were noted in association with these kilns, they presumably had been present. Although not directly associated with brick or tile manufacturing sites, one marl pit (LIHS-011-010) in Springtown was identified near a farmstead.

A tile kiln (LIHS-018-006) is recorded in Sir Richard Griffiths' *Primary Valuation*, 1854, just south of Killashee. This site is not marked on the 19th century cartographic sources, and it is likely that many such sites of this nature have not been picked up in the LIHS survey. The location of this tile-manufacturing site near the Royal Canal demonstrates the importance of the canal, not only in facilitating transport for brick and tile works, but also in identifying suitable sites, as drainage during the construction of the canals often exposed clay sources (Rynne 2006, 166-7).

7.6. Horse-power and wind-power at extractive sites.

No horse-powered industries were identified during the LIHS survey, despite their prevalence in the 19th century in Ireland, and the fact that horse-powered threshing mills are generally marked on the First Edition OS maps in other counties (Rynne 2006, 16, 22). Rynne (*ibid.*, 17-9) notes that all of the principle 19th century mining and quarrying operations in Ireland used horse-power, and that a number of brick-fields also used horse-power, so it is likely that these were present in Longford. Despite this, none were identified in the LIHS survey. The use of wind engines or wind-pumps to drain quarries is mentioned by Rynne (2006, 29 and 152) as being rare, and again no wind-pumps were identified in Longford (although a wind-powered pump used for agricultural purposes was identified – see Section 8.2 below).

7.7. Timber manufacturing.

Water-powered saw mills were the only timber-working buildings identified in the survey. Six of these sites, which were used to power a blade to cut timber, were noted. The saw mills (similarly to watermills in general, which are discussed in more detail (refer Section 10.3 below), are distributed along the Camlin and Inny rivers and their tributaries. The river water would have been used not only to power the mills, but also to carry the wood to and from them.

Interestingly, two of the saw mills were also associated with larger houses of landowning classes. This was noted at Kilshruley Manor saw mill (LIHS-010-00402) and Newcastle Saw Mills (LIHS-027-01102). This is a pattern which was also noted in County Kildare (Giacometti *et al* 2008, 70). This suggests that in some cases local important and wealthy individuals constructed saw mills in order to stimulate local industries. The saw mill at Kilshruley was also associated with a smithy.

These saw mills were established at the turn of the 20th century, with the one exception of the Newcastle Saw Mills (LIHS-027-01102), which was slightly earlier. All of the saw mills were converted from, or constructed over, previously existing 19th century corn or textile mills or distilleries. They do not appear to have operated for very long. For example, the saw mill on the northern bank of the Camlin in Longford Town (LIHS-013-01325) was only in use for a generation. As a result, they do not appear on 19th

century documentary or cartographic sources, and are only shown on the 1911-15 editions of the Ordnance Survey maps.

In general, these saw mills do not survive today, with the exception of occasional related millrace and weir survival at Longford Town and Newscastle. The Kilshruley mill was recently demolished for road-widening (Courlander & Courlander 1976, 12), and the only remains of the mill at Kilnasavoge (LIHS-014-00303) is a thirty foot high brick chimney, which belonged to the earlier flax mill (*ibid*, 11), and is a Protected Structure. The mills in Longford Town are demolished, and an archaeological excavation in 2004 at the site of the saw mill on Great Water Street (LIHS-013-01315) found that the sub-surface remains of the mill were highly disturbed, and they were not preserved in the modern development there (Bennett, *Excavations* ref. 2004:1050).

8.0. PRELIMINARY ANALYSIS OF SERVICE AND UTILITY DATA.

8.1. Introduction.

From the later 19th century, the utility industries of gas and electricity (peat is dealt with separately below in Section 9.0.), and the ongoing development of the postal and telegraph communication systems, contributed significantly to the industrial development of the county. This period also heralded important advances in sanitation technology. The material remains of these utility industries, and also of the postal service, can be seen throughout Longford, and have been included in the LIHS survey. Many of the features associated with the service and utility industries in Longford are not specific to the county, and should be considered in light of industrial developments at a national rather than regional level.

8.2. Sanitation: water and waste.

Public health engineering, in the form of water and waste services, developed in tandem over the past 150 years in response to the understanding of the link between contaminated water and disease (Corcoran 2005, 1). Water supply and drainage systems, though not as visible as the canals, railways and road infrastructure, are nonetheless critically important for the development of towns, and can be considered to be 'the most fundamental and hidden infrastructure' (*ibid.* 3).

Cast iron water pumps and water hydrants from the period 1880-1905, of which 30 were included in the LIHS, are amongst the best-preserved industrial monument of this category, and the survival of these is due in no small part to their aesthetic qualities. The large majority of these, whilst occasionally noted on the Ordnance Survey maps, are never noted on other maps or in documentary sources. However, many of these have been inspected and recorded by the NIAH, and in the cases of the large towns and villages, have been incorporated into the objectives of Local Area Plans, and from next year many will be incorporated in the Record of Protected Structures.

Hydraulic Rams, which generally dated to the late 19th and early 20th centuries, are often associated with the larger estate houses, reflecting the adoption of rich landowners of new technological advances that provided pumped water before the

rural electrification schemes. Two hydraulic rams (LIHS-026-003 and 010-005) were identified on Third Edition maps, at Castlecore House and at Kilshruley House. Hydraulic rams were ingenious devices powered entirely by the water they pumped. They worked by forcing water into pressured constricted passages and using the pressure to force it upwards (Rynne 2006, 50). The ram at Castlecore House was associated with water tanks. A cistern (LIHS-015-018) was identified from First Edition maps at Cloonshannagh House.

A late 19th or early 20th century wind-powered pump (LIHS-009-023) was identified, in Currygrane townland. This was probably used to pump water for agricultural use, and, in the unlikely case that it still survives on the ground, would be both rare and interesting to investigate. Less rare are the modern water towers associated with towns, such as the 20th century concrete water tower was identified (LIHS-027-00309) in Ballymahon from the NIAH survey.

Late 19th century advances in drain and sewer systems are represented in the freestanding cast-iron vent pipes which are still visible in towns today, for example at Newtownforbes (LIHS-008-00904), Granard (LIHS-010-01313) and Edgeworthstown (LIHS-015-00604 & -00610).

8.3. Power: gas and electricity.

Relatively few power generation features were identified during the compilation of the survey, and of those recorded, the most important are the turf-powered plants situated in Lanesborough, which are discussed in the following section. Hydroelectric plants appear not to have been constructed in the county, and gas-powered generators do not appear prior to the mid-19th century.

One mid-to-late 19th century Gas House (LIHS-008-019) that provided power to the Castleforbes Estate was identified. This appears to have been replaced in the early 20th century by an electrical engine house (LIHS-008-007). Another late 19th or early 20th century gas works was identified (LIHS-014-004) at Carrickglass Demesne, where it was situated discretely and screened from the main house and main approaches. The only

gas works site not associated with a large estate was a large mid-19th century gas works on Great Water Street in Longford Town (LIHS-013-01318).

A similar pattern in the location of gas works was seen during the compilation of the Kildare Industrial Heritage Survey, where it was noted that early 19th century gas works were confined to the larger estate houses, and only began to serve the larger towns in the second half of the 19th century.

19th century gas works employed a complex system of carbonisation (see Rynne 2006, 423-4) to produce gas from coal, and the resulting gas was stored in large circular gasholders (occasionally labelled gasometers on the OS maps), which are often the only surviving element of the gas-processing industry. Due to the large amount of heavy raw materials needed for the gas works, they were often situated on the banks of the canals or rivers (in the case of the Longford Town gas works, on the Camlin River).

8.4. Postal services & other communications.

The establishment of the Post Office Mail Service contributed extensively to improvements to Longford's road infrastructure between 1789 and 1819 (Broderick 2002, 120-131). Post offices and post boxes comprise the most obvious physical remnant of the postal services.

8.4.1. *Post boxes.*

29 post boxes were noted, almost all from the NIAH. These date from c. 1860 to c. 1940, and are all cast-iron freestanding pillar boxes or flat wall-mounted post boxes. All of the post boxes in the survey have been recorded and photographed by the NIAH. Late 19th century post boxes generally have the British Royal Insignia 'VR' (Victoria Regina, 1859-1901), for example the post box (LIHS-013-01333) set into the northern platform at Longford Town Railway Station, dated c. 1890. Post boxes from the beginning of the 20th century bear the mark of King Edward or George (ER VII & GR, 1901-1920), and these appear to be rarer in the county. Following independence in the 1920s the country's red post boxes were repainted green, and newly erected post boxes no longer bore monarchs' initials. They were instead marked 'S E' in Irish script (*Saorstát Eirinn*),

and later 'P & T' (Post & Telegraph). One example of these later types is the c. 1940 post box on the west End of Dublin Street in Longford Town (LIHS-013-01332).

The NIAH points out that these post boxes have industrial heritage value for a number of different reasons. Firstly, for their functional industrial designs, and as markers of cast-iron decorative detail from Victorian times to the latter part of the twentieth century. Their aesthetic contribution to the urban, and also rural, streetscape is also important. As well as these factors, the markings and design of the post boxes also chart the political changes in the governance of the country. As a result, and in full agreement with the compilers of the NIAH, we recommend that all of the post boxes (29 of them) be placed on the Record of Protected Structures.

8.4.2. *Post offices.*

32 Post offices were identified during the survey. Most of these (26) were identified from the 25-inch Ordnance Survey map of 1911-13, with progressively less marked on the 6-inch Ordnance Survey Third Edition (25), Second Edition (20) and First Edition (8) maps. Four post offices were also recorded by the NIAH. Most of the post offices are situated in rural locations, usually at road junctions. Of the urban post offices, the most impressive is 'Longford Town Post Office' (LIHS-013-01309), later the 'Museum and Heritage Centre', on Main Street, constructed in c.1894. In many cases post offices closed or moved, for example a post office has existed in Edgeworthstown since the early 19th century, although its location appears to have changed twice over that century (LIHS-015-00601 & LIHS-015-00602).

8.4.3. *Telegraph.*

Although no sites linked directly with the telegraph industry were recorded in the survey, the site of Edgeworthstown House (LIHS-015-00607) has been included due to the contribution to the industry by Richard Lovell Edgeworth, who was involved in the trial of the telegraph between Edgeworthstown and Pakenham Hall in 1756 (Rynne 2006, 444), and in the later setting up of the telegraph line between Dublin and Galway in 1804. Post-offices, particularly those situated in towns and larger villages, also functioned as telegraph stations and, later, telephone exchanges.

9.0. PRELIMINARY ANALYSIS OF PEAT-WORKING INDUSTRY DATA.

9.1. The peat industry.

The working and processing of peat (turf) was one of the most important industries in the southwest of Longford, particularly around Lanesborough, and all of the industrial peat working sites in the county are situated in this area. Although peat working was for the most part un-mechanised (Rynne 2006, 97-8), and relatively small in scale prior to the foundation of Bord na Móna in 1946, it was an important source of employment in the region. A number of industrial sites relating to peat working have been identified during the survey, and the material remains of these sites is dominated by the Bórd na Móna railways. The range of sites associated with the peat industry overlap with the power and rail industries.

Peat became established as the main fuel of Ireland by 1800 (Rynne 2006, 98) as a direct consequence of the completion of the canal systems. During the 19th century, the peat extraction industry was notable for its relatively small scale and local emphasis - in fact its lack of industrialisation, despite the enormous potential of the canal infrastructure. In fact, no large-scale and commercially-successful peat extraction industry grew up anywhere in Ireland during the century following the completion of the main canal network, although a number of failed industrial ventures are recorded in the country (for example in Kildare). It was not until the mid-20th century and the establishment of Bord na Móna work that a real peat industry developed.

The railway network (LIHS-012-002, 013-025, 017-008, 018-001, 022-002 and 022-005) which runs over the bogs in the southwest of county Longford was constructed in the 1940s from cast-iron tracks which are of a narrower gauge (3 feet, 914mm) than other railways (hence their name 'narrow-gauge' railways). Due to the mid-20th century date of these sites, they only appear on recent maps (e.g. Discovery Series map (1:50,00), 1996-8 Edition). They are also recorded in the NIAH and TCD National Civil Engineering Database and in Johnson's 1997 book on railways.

The Bord na Móna railway crosses the Shannon River at Kilnacarrow, near Lanesborough, by way of a five-span industrial railway bridge (LIHS-012-00201), which

is a remarkable piece of engineering, measuring 118m in length, and constructed from reinforced concrete and steel. Other features of particular industrial heritage interest associated with the Bord na Móna railways have been noted, including a mid-20th century level crossing (LIHS-018-00101) in Derrynaroge bog, recorded by the NIAH. The importance of Lanesborough as a centre of the peat-working industry is reflected in the Lanesborough Bord na Móna Housing Scheme (LIHS-017-00104), an estate of 61 terraced Bord na Móna workers' houses after the passing of the Turf Development Act of 1950 (NIAH).

The narrow-gauge railway network connected the extraction sites on the bog with Lanesborough Power Station (LIHS-017-00701). Although now decommissioned, this was Ireland's first turf-powered power station, and was constructed over three phases from 1958 to 1983 by the Turf Development Board. Part of the complex still survives, dominating Lanesborough town, and now comprises the station building, turbine hall, a cooling water pump house, water treatment plant, two concrete chimneys and other features. The station is presently being demolished. In recent years a new turf-powered power station has been constructed nearby (LIHS-017-00702), and this will run for 15 years before being decommissioned in c. 2015.

10.0. PRELIMINARY ANALYSIS OF DATA RELATING TO MANUFACTURING AND MILLS.

10.1. Introduction.

Manufacturing industries and mills in Longford were organised into a number of categories and sub-categories during the compilation of the LIHS database. These categories were based on both the nature of the power driving the mill (windmill or watermill), and the function of the site, (sub-categories of food, drink, building materials & timber, textiles & leather, metal, chemical, other and unidentified). During the course of the Survey it became apparent that a number of these sub-categories held relatively few site types.

Overall, very few ceramic, glass, metal and chemical manufacturing sites were identified. This contrasts strongly with the variety of industrial sites in the port cities of Dublin and Belfast. The situation reflects the lack of emphasis on large-scale urbanisation in Co. Longford, and its peripheral nature in terms of accessibility to coal and iron resources, which were imported into the country in the 19th century. Instead, the distribution of manufacturing industries in Longford reflects a dispersed and rural pattern, dominated by watermills, which were the most common manufacturing site-type identified after lime kilns. Excluding those manufacturing sites associated with the extractive and building-processing industries (which are discussed in Section 7.0 above), 279 manufacturing sites were identified in Longford, representing 40% of the total number of sites in the LIHS database.

10.2. Windmills.

Windmills became common in Ireland from the 17th century onwards (Rynne 2006, 13). Three windmills were identified in Longford: two situated on hills overlooking the eastern shores of Lough Ree (Knock Windmill LIHS-017-004, and Elfeet Windmill LIHS-021-003), and one near Granard (Ferskin Windmill LIHS-010-012). A fourth possible windmill was identified near Edgeworthstown (Windmill Hill LIHS-015-020).

The small number of windmills identified overall, and the absence of windmills elsewhere in Longford, is due almost certainly to the much greater potential for using

water power (e.g. Rynne 2006, 27), and indeed there is an inverse correlation with the distribution of watermills. The windmills identified here are of the ‘tower mill’ type, with a fixed masonry base or shaft (which was circular in shape in all of the examples here) and rotating wooden sails powered by the wind to work the millstones. All are likely to have been used for the milling of cereals, although Egan notes that the windmill at Knock may have been used in linen production after it ceased to be used to mill corn (Egan, www.longfordgenealogy.com).

Rynne (2006, 25-7) distinguishes between windmills constructed before 1770 and those constructed after 1770. The earlier type, he suggests, had a rubblestone masonry tower 3-4 stories high and 3-4m in internal diameter, which held wooden machinery (that rarely survives) operating a single pair of millstones. These windmills had two doorways at the base, as their short stature meant that one doorway was periodically blocked by the sails. The larger post-1770 type is larger, at 5-8m internal diameter and 10m in height, and was able to operate two pairs of millstones (*ibid.* 25). Rynne (2006, 25-27) suggests that most windmills marked on the OS First Edition maps, as all the Longford examples are, belong to the later type.

All three definite windmills are marked (as ruins or stumps) on all three editions of the OS maps. They also appear on Edgeworth’s 1814 map, and one is marked on Maps of the bogs of Ireland of 1810-13. Their high profile positions and usefulness as landmarks meant that their sites were recorded and remembered long after they went out of use. Two of the windmills (Knock and Elfeet) have been inspected by the NIAH, and the first of these is included on the Longford Development Plan 2003-9 Protected Structures list (albeit as ‘Knock Watermill’), whilst the second is protected in the Record of Monuments and Places as a ‘possible windmill site’.

10.3. Watermills.

10.3.1. *Watermills and cereal processing.*

Watermills (along with lime kilns) are the most common and widely distributed industrial building identified in the LIHS, and a total of 134 watermills or watermill – related features (mill races and mill ponds, but also including 5 bridges and 44 corn kilns) were identified in the county. These are depicted or mentioned in every

cartographic and written source consulted, and are present in every locality, however there are particular concentrations of watermills along the Camlin and Inny rivers. Watermills are present in almost all of the 18 urban areas that have been listed for Longford (see Section 11 below) but their distribution is overwhelmingly rural, and catered for the needs of local communities. Rynne (2006, 30) describes watermills as ‘the backbone of Irish industry’ for the 18th and much of the 19th centuries.

10.3.2. *Watermill functions.*

The function of the some of watermills identified in the Survey are not indicated on the cartographic sources, however the vast majority are likely to be cereal-mills (either corn mills or flour mills), in particular those where a different function (such as textile-mills or saw-mills) has not been indicated. Hogg (2000, Appendix ‘The Windmill, A Wider View & Summary’) summarises the functions of the mills of Longford listed in Griffith’s Valuation of 1851 and the Longford Mill Book. Of the 71 mills identified from those sources, 50 are listed as ‘corn-mills’, 2 as ‘flour-mills’, 2 as ‘bleach-mills’, 3 as ‘tuck-mills’, and 14 as ‘other’ (which include shelling mills and kilns). Assuming this is a representative sample (Hogg (2008, 7) also analyses mills appearing on the First Edition OS map, with similar results), and bearing in mind that many more mills have been identified in the LIHS than have been listed in Griffith’s 1851 Valuation and the Mill Book, the assumption that un-marked mills are cereal-processing mills would appear to be correct.

Thus out of the 115 watermills or mill-related sites in the LIHS (having excluded miller’s houses and dual-function mills), 74 were positively identified as corn or flour mills, 9 as textile-mills and 6 as saw mills, leaving 26 water mills or mill features whose function was not established. If these are presumed to be cereal-processing mills as suggested (and they are predominantly of 18th century date), then the 85% of watermills identified as cereal-processing sites in the LIHS is directly comparable to the figures in the in the mid-19th century sources described above. In some cases, cereal and textile processing could be combined in one mill, for example at Ballywillin Corn Mill (LIHS-011-00601). Other watermills show changes of function over time. For example, all of the saw mills (see Section 7.7 above) were originally constructed as corn mills.

10.3.3. *Dating of watermills.*

Watermills are one of the earliest industrial buildings in Ireland, and numerous Early Medieval examples have been excavated in the country. Despite the fact that no watermills are noted in the Record of Monuments and Places for Longford, and despite the fact that no medieval mills are recorded as having been identified archaeologically in the county in the last few decades (Bennett 1970-2004), these must have existed in the past. In many cases, the First Edition OS maps note the presence of 'Old Mills' (e.g. LIHS-015-008 at Tully), or marks disused mill-races (e.g. LIHS-006-00603 at Aghakline), which are likely to represent 18th century milling sites. The mills in the LIHS, however, were for the most part in use during the 19th century, although many of them are likely to have been established earlier.

One of the 18th century mills identified is Knockanboy Corn Mill (also called Cloonturk Corn Mill, LIHS-013-00801), which appears on Brownrigg's 1795 survey of the Manor of Granard, and which survived into the mid-19th century. It is marked on the First Edition 1836-7 map, recorded in the OS Field Books of the 1830s as 'a good corn mill', and listed in Griffith's Valuation of 1854 as belonging to James Shaw (Hogg 2000, 347). The lane with which the mill was connected to the main road to Longford is still apparent in the OS First Edition, but is absent on later maps, although the mill survived into the early 20th century. It can be surmised that the canal offered a new means of transporting produce to and from the mill, in particular linking it directly with Longford to the north. This was obviously advantageous for the mill, as it is one of the few rural 18th century mills to have continued in operation into the 20th century. Nothing now remains of the site above ground (Courlander & Courlander 1976, 10).

The corn mill at Abbeyland (LIHS-015-005) has the potential to be amongst the earliest water mills identified in the survey. The location of this mill within the former abbey grounds suggests that it may be an older feature associated with the abbey. The small size of the mill and its relative inaccessibility from the main roads also point to an older date. Origins of the mill may extend back to the post-medieval foundation of the abbey, which may be identified with the Ballysaggart foundation listed in Gwynn & Hadcock (1970, 268). If this is the case, the abbey was a Franciscan establishment,

founded in the 16th century, and the mill could therefore date back to the 16th or 17th centuries. This mill became disused in the mid-19th century, not surviving the construction of the railway to the north.

In many cases the mills identified in the Survey are marked on every cartographic source examined, for example the Shrute Mills complex (LIHS-026-004), which is likely to date to the 18th century. In this case the NIAH records the building as dating to c. 1820. This situation recurs in many mills identified in the Survey which are also listed by the NIAH, and is a result of the re-building of many mills in Longford during the later 18th and early 19th centuries. Mills were often rebuilt at this time due to significant improvements in watermill technology driven by the corn bounties (Rynne 2006, 256-9), and the change from wooden millwheels to pre-cast metal wheels (which did not always fit the original building), which was partially due to the difficulty of sourcing suitable timber during the Napoleonic Wars (Rynne 2006, 36-7)

10.3.4. *Description of watermills.*

Watermills were generally small buildings (although large milling complexes have been identified, particularly in the later 19th century) and of course were always situated on a water source. A mill-wheel (originally made of wood, from the late 18th century onwards made of iron) was driven by the water and rotated a pair of stone mill-wheels which ground the cereal into flour. The earlier mills used a single pair of mill-wheels, however by the 19th century two pairs became increasingly common (Rynne 2006, 36-7, 194). From c. 1760 mill buildings had grain kilns (to dry the cereal) built into the building (Rynne 2006, 198), and 44 of these have been identified at a number of corn mills, for example at the corn mill in Drumlish (LIHS-005-00702). The First Edition Ordnance Survey maps (1336-7) depict numerous corn drying kilns which are not associated directly with mills scattered throughout the county, and 43 (out of a total of 87 corn kilns) of these were identified, often in isolated clusters, for example at Laughill (LIHS-010-008). Another feature sometimes associated with corn mills are grain stores, for example the grain stores (LIHS-027-00310) at Ballymahon Corn Mill. These are not usually labelled on cartographic sources, and when identified it is usually from a documentary source.

Water mills are always situated on or near to rivers or streams, and mill-races were generally constructed in order to control the flow of water to power the wheel. These millraces could be of various lengths depending on the location and requirements of the mill and many of them incorporated a mill pool to further control the water flow (Rynne 2006, 40, 43). These various components of the mill are sometimes individually labelled on the cartographic sources. In some cases, the presence of a mill has been identified by the presence of a mill-race or mill-pool alone (e.g. LIHS-027-013 at Keel). Weirs constructed in rivers to channel mill-races often survive well after the mill buildings have gone, for example at Longford Town. Bridge-arches were also used to channel mill-races, and this has been noted at several sites (e.g. at Shrule LIHS-026-00403 and at Legan LIHS-024-00101).

None of the mills constructed (or more usually re-constructed) after the establishment of the Royal and Grand Canals appear to have used the canal waters to supply their mill ponds and races, with one notable exception of a corn-mill in Gorteenboy (LIHS-018-012). Griffith's Valuation of 1854 specifies that 'water power was supplied to the corn mill', and that it was owned jointly by a Mr. James Egan, the MGWR Railway Company and the Royal Canal Company (Hogg 2000, 346). This unusual arrangement (made more unusual by the fact that no mill is explicitly labelled as such in Gorteenboy on any of the 19th century OS maps) suggests that in this case, water from the Royal Canal was used to power the mill.

Two existing surveys incorporating industrial buildings in Longford (Courlander & Courlander 1976, and the NIAH) have recorded watermills that are still standing in one form or another. A number of mill buildings are also listed in the Longford County Development Plan as Protected Structures. One example of a surviving mill building is Aghnashannagh Mill (aka Foster's Mill, LIHS-009-01901), situated just north of Ballinalee. This mill, which is listed in the Valuation Office Mill Book of c.1840 as a Corn Mill with two wheel pairs owned by Mr William Foster, is recorded as a particularly fine mill, used to grind wholemeal for porridge. The entrance to the mill building is marked by two millstones from another mill in Co. Mayo (ibid., 87). Aghnashannagh Mill has been disused since 1960, but survives in excellent condition

with all its machinery *in situ*, and has since been renovated (Courlander & Courlander 1976, 8). Another important watermill complex with significant remains is located at Shrule (LIHS-026-004), where two mills were situated close together.

10.3.5. *Discussion of Watermills.*

The ubiquity of cereal-processing watermills in Longford, particularly in comparison to other manufacturing sites, is partially due to the emphasis placed on them by cartographers from the start of the 19th century. Watermills are the only industrial site-type to be marked on every single one of the cartographic sources assessed for the LIHS.

Between 1757 and the 1790s, the government set up a system of flour subsidies for the production of flour for Dublin, and these were known as the 'corn bounties' (Rynne 2006, 256). The corn bounties were set up to stimulate the production of flour in Ireland, rather than importing it from England, and proved very successful. Not only did they encourage a boom in Irish cereal production, technological advances in milling practices, and mill construction in the late 18th century, but they also encouraged the development of better transport infrastructure (Broderick 2002, 91-3).

The cereal-processing industry straddles the line between industry and agriculture, and this is particularly clear in the case of corn- and flour-mills (which are in fact different types of mill differentiated on the basis of how finely the cereals are ground, but which are referred to as one type in this report). As the mills of Longford became larger and could process more grain over the course of the later 18th century, so agricultural production and the improvement of land for agricultural use was encouraged. Thus the construction of the canals that drained bogs to make additional farmland, the proliferation of lime kilns to make quicklime for improving the soil, and the boom in corn-mills are all inter-connected. The construction of these industrial features altered the landscape of Longford County during the late 18th and early 19th centuries in a manner that encouraged the production and supply of agricultural produce on a larger, and indeed industrial, scale.

In the aftermath of the Great Famine of the 1840s, the use and numbers of corn mills declined, in part due to importation of increasing amounts of cheap flour from the United States in the late 19th century and early 20th century (Rynne 2006, 256).

10.4. Breweries and distilleries.

In contrast to the dispersed rural distribution of cereal-mills in County Longford, breweries and distilleries are all located in large urban areas. Brewing involved the manufacture of beer, which in Ireland generally meant porter (otherwise known as ‘stout’). Distilleries were common in Ireland from the 18th century onwards, and manufactured wine spirits and flavoured drinks as well as the more typical whiskey (Rynne 2006, 248-50). No malt houses were identified in the county, which suggests that the brewing and distilling companies would have controlled their own associated maltings in the early 19th century (Rynne 2006, 236). Malt houses provided both breweries and distilleries with the main ingredient in their respective products, which was manufactured through a process of spreading, heating (in kilns) and steeping (in water) the cereals.

The drinks industry in Longford developed in tandem with, and for the same reasons as, developments in agricultural production and cereal milling. Distilleries were often converted from earlier corn mills in the early 19th century (generally the 1820s), however this industry suffered a significant set back in the mid-19th century due to the Temperance movement, and all four of the sites were converted (back) into corn mills at this time, or in the case of the Longford Town brewery, into a butter market.

Four such sites were identified in the LIHS: a brewery (LIHS-013-01314) and distillery (LIHS-013-01313) off Great Water Street in Longford Town, a brewery in Granard (LIHS-010-01104), and the Richmond Mills whiskey distillery complex in Cloondara (LIHS-013-00303). This latter complex was particularly extensive and comprised a large number of different buildings, and has now been converted into apartments.

10.5. Textile mills.

10.5.1. *Introduction.*

Textile mills and factories (the words were used interchangeably in the 19th century; Rynne 2006, 231) are surprisingly badly represented in Longford, considering the importance of the linen industry in the county (Egan, undated). Nine textile mills and three tanneries were identified in the LIHS.

10.5.2. *Wool production.*

In the 18th century, the various processes of wool production (spinning, weaving and finishing) were carried out at different locations (Rynne 2006, 222), using readily available sources of motive power. This led, for example, to the dual functioning of a number of corn-mills as both cereal and textile-manufacturing sites (*ibid.*, 221), however no clear examples of these were noted in Longford.

Processing of wool did not just involve the spinning of thread into fabric, but also encompassed sites such as 18th century tuck mills, which were used to finish woollen cloth by pounding it with soapy water (Rynne 2006, 221). No definite 18th century tuck mills were identified in the county, and 'Old Tuck Mill' (LIHS-006-008) marked on the 1837 OS map near Aughnacliffe to the west of Lough Gowna appears to be the earliest of this type. Three other early- to mid-19th century tuck mills were noted in the northern part of the county (near Aughnacliffe, near Ballinamuck, and near Ballinalee), and a fifth was noted to the west of Ballymahon on the Inny.

These scattered sites declined in the 19th century as they were gradually replaced by larger wool factories (where all the various processes were combined under one roof) operating from urban areas, the only example in Longford being the large woollen mill complex at Ballymahon (LIHS-027-008), which is also a Protected Structure.

10.5.3. *Linen Production.*

Longford developed an extensive and important linen industry in the 18th century (Egan, undated.). The Longford linen industry started in the late 17th century, due to the confluence of several factors, including the suitability of the soil and climate for the growing of high quality flax; the nature of the small-scale farm holdings which leant themselves so well to labour intensive industries; the influence of the descendents of Scottish planters who moved to north Longford; and the introduction of English laws

that discouraged the export of wool from Ireland, and instead promoted the manufacture of linen (*ibid.*).

In the 18th century, Ballymahon, Granard, Longford and Lanesborough had become centres of the linen trade, and bleach yards were widespread throughout the county (*ibid.*). It is therefore disappointing that so few linen-related industrial sites were identified in the county. Only five such sites were identified, and none of these was a bleach yard or bleach field. This lack of linen sites in the LIHS is a factor of the reliance on 19th century sources for the survey, a period which coincides with the collapse of the industry in Longford due to the Great Famine and the introduction of cotton. Anecdotal evidence, however, may reveal the presence of bleachyards, and for example one is thought to be present in the housing estate known as the 'White Linen Woods', near the Sligo/Drumlish roundabout and Axis shopping area in Longford Town.

A bleach and a flax mill were identified at Cloondara, one of which (LIHS-013-00312) has been tentatively identified on the site of the Richmond Inns at the Richmond Canal Harbour, and both of these may have been of 18th century date. A mid-19th century flax mill was also noted to the east of Longford Town at Kilnasavoge (LIHS-014-00304).

Occasionally mills used in wool manufacturing were also used in linen manufacturing, and indeed the required processes were not dissimilar, and the machinery could be easily adapted. An early 19th century bleach and tuck mill (LIHS-010-00401) near Ballinalee appears to have been one such site, and the mid-19th century Longford Mill Book lists the Ballymahon Woollen Mills as a flax mill.

10.6. Tanneries.

Three early 19th century tanneries were identified by the LIHS. The largest was at Longford Town (LIHS-013-012322), with smaller tan yards in Granard (LIHS-010-01309) and Ballymahon (LIHS-027-005). These comprised large complexes of buildings and yards, in which animal hides were steeped in pits filled with tanning solution (generally crushed oak bark) to turn them into leather. Tanneries were amongst the most important industrial complexes in the larger cities of Ireland in the late medieval and early post-medieval periods, and leather is historically one of the most important

Irish exports. The leather-making (tanning) and leather-working processes are discussed in detail in a number of publications (e.g. Reed 1972, Thomson 1988). The location of the three Longford tanneries at the edges of larger towns is a common pattern which can be noted on a national level.

10.7. Metal industries.

The absence of extensive iron and coal deposits in Ireland meant that large iron-working industries only developed in the larger port towns during the 18th and 19th centuries (Rynne 2006, 105), and no large-scale metallurgical industries were identified in the Survey. On the other hand, small smithies and forges have been identified all over the county, despite being relatively under-represented in the cartographic sources (refer above, Section 4.4.4). A total of 82 of these were identified. They would have manufactured and fixed agricultural tools, but primarily they would have been involved in shoeing horses. Horse-and-cart was the most common method of transport and carrying industrial products around Longford prior to the construction of the canals, and even in the canal age all the barges would have been pulled by horses. Thus the distribution of the smithies is generally at crossroads or along main roads. They are generally small buildings fronting onto the road, with a similar sized building located next to them, slightly offset from the road. This second building was probably the family farm.

Only 18 out of the 82 smithies were marked on the First Edition maps, and these are likely to represent the longest-established smithies. One example (LIHS-023-00701) was situated at a crossroads at Tennialick where a smithy was present on the same site (albeit in different buildings) from before 1836 to the early 20th century. This smithy would have catered for the needs of the local community and the small hamlet of Colehill. A straight avenue provided a direct link from the crossroads to the Royal Canal, which may indicate that the smithy also catered for passing trade from the canal. In addition this smithy was also linked to a large house known as 'Hermitage' (later Knockagh House and shown as ruinous on the early 20th century maps), which may have also been served by the smithy.

Although many smithies remained in use over the course of the 19th and 20th centuries, a number went out of use in the mid-19th century, perhaps due to the effects of the Great Famine, or perhaps of the rise of railways. One of these (LIHS-002-00403) was recorded on the northern outskirts of Ballinamuck village, where it appears on the 1836-7 Edition OS and on the OS Field Name Books of the 1830s. By the early 20th century Ballinamuck had contracted so much that this location was now well outside the confines of the village. No smithy was marked in Ballinamuck on the later 19th century and 20th century OS maps, with the closest smithy shown probably being that in Fardrumman to the west (LIHS-002-001).

Perhaps the best-known smithy in the county is MacEoin's Forge (LIHS-009-025), which is recommended for inclusion in the new County Development Plan in 2009. This forge is associated with General Sean MacEoin who trained as a blacksmith here before becoming an important military and political figure in the 1920s and during the struggle for independence (NIAH).

10.8. 20th century factories.

Factories show up rarely in the LIHS, reflecting both the non-urban aspect of Longford's development and the limitations of the study. Longford's factories date to the latter part of the 20th century, a period that was under-represented in the cartographic and other sources examined during the project.

Factories are almost always associated with large urban centres and are generally located on the outskirts of the town. The Hirsch Ribbon Factory (LIHS-013-01338) founded by Jewish refugees in the 1930s, was located on the Battery Road in Longford, adjacent to Connolly Barracks, and is now a branch of the VEC. It is very distinctive as a factory and has the saw-profile roof one would associate with early 20th century factory buildings. Two factory buildings were noted at Edgeworthstown (C & D Foods and Paul and Vincent, LIHS-015-00608 & -00609), two at Granard (Kiernan Milling and Pat The Baker, LIHS-010-01315 & -01316), and one near Cloondara (the former Atlantic Mills denim factory LIHS-013-00103). It is notable that three out of these five factories are involved in the manufacture of animal feed.

11.0. PRELIMINARY ANALYSIS OF DATA RELATING TO URBAN AREAS & MISCELLANEOUS FEATURES.

11.1. Urban areas.

11.1.1. *Introduction.*

Urban areas provide the most dense and varied collections of industrial monuments in Longford. These centres of population and services attracted industries due to the population densities, providing both a source of labour and a ready market, and generally superior transport links, and at the same time those same industries provided further impetus for their urban development. 18 urban areas have been listed for the county, and these can be divided into three tiers based on the nature and quantity of industrial features within them. Although not based on size, the population density of these settlements is likely to be represented in the range of industrial features.

11.1.2. *Tier One.*

The four largest areas all have modern planning designs in the form of Local Area Plans (LAPs), and were substantial population centres, generators of industry and nodal points in the communication network. These are Longford Town (LIHS-013-013), Granard (LIHS-010-013), Edgeworthstown (LIHS-015-006) and Ballymahon (LIHS-027-003). All four had significantly greater concentrations of industrial features than anywhere else in the country. All these towns have excellent transport links with the rest of Ireland, in terms of road (all four are on National Roads), river and canal (Longford and Ballymahon) and rail (Longford and Edgeworthstown). As a result, these centres have industrial heritage features associated with roads (e.g. the turnpike and coach station in Longford Town), rail (e.g. Edgeworthstown Railway Station LIHS-020-009) and canals (e.g. canal offices north of Ballymahon).

As well as industrial features relating to transport, these centres also have sites related to services and utilities (postal, waste, water, power) and typical small-scale industrial buildings (smithies and water-powered corn mills). These are also found in Tier Two and Three settlements, however these Tier One settlements generally have numerous examples of each. For example Longford Town and Granard each have four smithies.

The Tier One urban areas also have dense concentrations of manufacturing industries which are absent in the Tier Two and Three urban areas elsewhere in the county. These include mills and factories of various functions, for example textile manufacturing sites at Ballymahon; breweries, distilleries and saw mills at Longford Town; and 20th century modern factories at Granard and Edgeworthstown.

In addition, these four Tier One towns have industrial features that are particular to larger urbanised centres. All four have market houses or sites of agricultural (butter, corn or pig) markets (3 in Granard; 5 in Longford; 1 in Edgeworthstown and 1 in Ballymahon). Union Workhouses were identified at Longford Town, Granard and Ballymahon. As mentioned above (refer Section 10.6), tanneries were located outside Granard, Longford and Ballymahon. Dairies were identified in Longford Town and Granard, and the former also had an abattoir. Longford Town also had a potter's kiln and a brick works.

11.1.3. *Tier Two.*

Six urban areas have been identified as belonging to Tier Two. These were usually located on one or more important communication routes, such as road, river, canal or rail, and they are often associated with a particular industry, the most obvious example being Lanesborough and the peat-processing industry. These Tier Two urban areas are Newtownforbes (LIHS-008-009), Ballinalee (LIHS-009-020), Lanesborough (LIHS-017-001), Keenagh (LIHS-022-013), Abbeyshrule (LIHS-023-016) and Cloondara/Cloondra (LIHS-013-003). They generally have Local Area Plans, with the notable exceptions of Cloondara and Abbeyshrule.

These have a moderately dense concentration of industrial features, which in almost every case includes transport-related features (bridges), service-related (post offices and post boxes, water-pumps or hydrants, and sewerage vents), and small-scale rural manufacturing industries (corn mills and smithies, sometimes located just outside the town). This range of industries is typical of Tier Three settlements, but the distinguishing feature of the Tier Two settlements is the larger size or special characteristics of these.

Tier Two Settlement	Industrial Features
Lanesborough	Peat-processing related industries (housing, power stations & railways) Knock Windmill Shannon waterway (harbour, dock, importance in Linen industry)
Keenagh	Royal Canal (canal harbour) Mosstown flour mill complex
Newtownforbes	MGWR Rail links (station) Castleforbes Estate (with associated early gas and electrical generators) Position on main road.
Balinallee	Aghnashanna Mill, and two other corn mills Camlin Waterway MacEoin Fore (historical importance)
Cloondara/Cloondra	Royal Canal (harbour, offices, dry dock, lock) Cloondara Canal complex; Shannon waterway Corn mill, textile mills and distillery
Abbeyshrule	Royal Canal (stop, bridges) Inny River waterway Whitworth Aqueduct Clynan mills complex

11.1.4. Tier 3.

The eight Tier Three urban areas are generally rural villages, however they have concentrations of industrial heritage features. These are Ballinamuck (LIHS-002-004), Moyne (LIHS-003-001), Abbeylara (LIHS-011-009), Killashee (LIHS-018-018), Barry (LIHS-023-001), Legan (LIHS-024-001), Drumlish (LIHS-005-008) and Ardagh (LIHS-019-007). Two of these (Drumlish and Ardagh) have Local Area Plans (smaller villages are generally not covered by Village Design Statements rather than LAPs).

Industrial features listed for Tier Three centres are generally service-related (post offices and water-pumps). Typically each is associated with a smithy and a water-powered corn mill (eg. Treel Corn Mill at Legan), both of which are located either within the town, or just outside it. These small rural villages occasionally have bridges, but only one (Killashee) is associated with the Royal Canal. Ardagh has few of the industrial features associated with the other sites, but it does have a coach station and a dairy, which are not noted at other Tier Three sites.

Village	Postal	Water	Corn Mill	Smithy	Other
Ballinamuck	Yes	No	Yes	Yes	-
Moyne	Yes	Yes	No	Yes	-
Abbeylara	Yes	Yes	Yes (two)	Yes	-
Killashee	Yes	Yes	No	Yes	Canal features
Barry	Yes	Yes	Yes	No	-

Legan	Yes	No	Yes	Yes	-
Drumlish	Yes	Yes	Yes (two)	No	-
Ardagh	Yes	Yes	No	No	Dairy and Coach house.

11.2. Large estate houses.

While large or private houses in general have not been included in the LIHS, a number of the larger estate houses deserve mention in terms of their importance in stimulating and structuring industrial development in their local areas

The activities of the occupants of these great houses are frequently well documented, and represent the power of individual initiative in driving industry in Longford, a classic example being the role of Richard Lovell Edgeworth in developing the transport and communications industries in the vicinity of Edgeworthstown House (LIHS-015-00607), and indeed in Ireland as whole. Many landlords saw the establishing of local industries and improvement of their land as having both moral and economic advantages. Such developments publicly fulfilled patriotic and religious duties, and simultaneously could act to increase estate profits.

Various minor industrial features are often situated in the demesne grounds of the large residences at the heart of many estates, as demonstrated by the construction of hydraulic rams (LIHS-026-003 and -010-005) at Castlecore House and at Kilshruley House, and lime kilns at Mosstown Demesne and the Newcastle Estate (LIHS-022-012 and -027-012). Brick works (LIHS-015-013 and -015-016) were also noted in and around Coolamber Manor Demesne. Postal services also are often associated with the larger estate houses, for example at Carrickglass Demesne.

Larger industrial complexes were also identified in demesne, where they often represented early and experimental uses of new industrial technologies within their local areas. Late 19th/early 20th century saw mills were converted from earlier corn mills at Kilshruley Manor and Newcastle Demesne. A good example of this is to be found at Castleforbes Estate, where a mid-19th century gas house was constructed

within its grounds (LIHS-008-019) and appears to have been replaced in the early 20th century by an electrical engine house (LIHS-008-007). Another example is the gas works at Carrickglass Demesne. It is interesting to note that, very often, the owners and managers of the larger estates would be the first to adopt new technological developments that were then later adopted by the municipal authorities for use in towns (e.g. gas works, water reservoirs, hydraulic rams and other features).

12.0. CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE WORK.

12.1. Introduction.

As noted elsewhere in this report, the LIHS desktop-based survey, which has been produced for Longford Local Authorities, represents the initial stage of what is intended to be a larger and broader inventory of Industrial heritage sites in Longford. It has succeeded in identifying 3,542 sites (including quarries and lime kilns which were not included in the database) of varying type within the county as a whole, and as such comprises a considerable body of information, which will form the basis for further work.

It is envisaged that such future work will involve both narrow specific studies focusing on particular site types or regions, and broader studies involving field visits over the entire county. It will, moreover, involve the identification of additional industrial sites, as well as the fleshing out of information on sites identified during the desk-based stages of the study. As many of the subsequent stages of the LIHS will be reliant on the interest of the local communities of Longford, and on information generated by dialogues with those communities, publicising the project as a whole will also be a crucial stage in its further development.

The desire to provide adequate protection of Longford's industrial heritage for future generations has been an important impetus behind this project. Section 12.2 below will outline the present status of protection for this heritage, which is primarily based on planning legislation, and Section 12.3 will discuss some of the limitations of the current legislation-led approaches to conserving industrial heritage. These centre on the fact that many classes of industrial heritage sites fall between existing means of protection, notably the Record of Monument and Places (RMP) and the Record of Protected Structures (RPS).

The ability to provide an adequate mechanism for ensuring the preservation of Longford's industrial heritage, is dependent on firstly establishing the extent of this heritage in the county. The LIHS therefore represents a critical first step in this process,

in that it has documented 701 sites for which cartographic and documentary evidence suggests the presence of industrial heritage features.

12.2. Survival of industrial heritage.

The LIHS survey has focused on the identification of industrial heritage sites from predominantly 19th century records, and as a result it is unclear what proportion of these features still survive today. Unfortunately, many industrial sites included in this survey are likely to be lost. As their original function became obsolete, they have become derelict or been demolished. This situation has been exacerbated by the frequent location of sites on or near canals and waterways and in towns, all of which are prone to residential development. There are exceptions to this, for example Ballymahon Mill has been sensitively converted into apartments.

Changing aesthetics have also had an impact on the survival of some sites, as they have come to be viewed as eyesores or as obsolete hulks, for example in the case of the old Lanesborough Power Station. Indeed the industrial sites most at risk are often those associated with the peat-processing industry in the vicinity of Lanesborough.

By contrast, industrial heritage sites associated with canal and road transport, in particular bridges, and to a lesser extent rail transport, have survived remarkably well. This has been remarked upon in the Waterway Corridor Study (Buchanan et al., Section 4.2.9), which notes that these ‘...have been sympathetically upgraded to take account of modern usage requirements; those attributes which make them special are still clearly evident. The fact that they remain in use, even though many are over 150 years old, is testimony to their robust design and quality of construction’.

12.3. Current Protection of Industrial Heritage.

The primary existing means of protection for industrial heritage in Longford is through the Record of Protected Structures (RPS), which is compiled by the local authority under the 2000 Planning and Development Act. The existing Longford County Development Plan 2003-2009 (CDP) lists 29 Protected Structures (Table 5.1), of which

three (Nos 2, 3 and 15, being Carriglass (twice) and Newcastle Demesnes) pertain partially to industrial heritage, as they include two post boxes and a lime kiln within the protected curtilages. In addition, twenty mill buildings are also included (Table 5.2) and are also protected by the plan.

Since the compilation of the 2003-9 plan, a number of significant additional studies have been conducted, which include the recording of industrial heritage features in the county. These are the Waterways studies along the Shannon and Royal Canals, and the National Inventory of Architectural Heritage (NIAH) for Longford. Both of these studies have identified and inspected industrial heritage sites, and the former study made recommendations for additional inclusions to the Record of Protected Structures (Lanesborough Bridge, quay and harbour) and the Record of Monuments and Places (Shrule Mills).

These recommendations, and in particular the results of the NIAH survey, have been taken into account during the compilation of the Local Area Plans (LAPs) by local authorities. LAPs have been carried out between 2004-8 for the towns of Keenagh, Drumlish, Longford Town Northern Environs, Granard, Lanesborough, Edgeworthstown, Newtownforbes, and Ardagh, as well as for Carrickglass Demesne. The Ballymahon LAP is in the process of compilation, and a development plan was carried out for Longford Town in 2004. These LAPs recommended industrial heritage features (usually those recorded by the NIAH within each area) for inclusion in the RPS which is set out in the new Longford County Development Plan (Draft) 2009-2015. As a result, most of the industrial heritage features within those areas which have been the subject of LAPs will be protected from early 2009.

An additional and important body responsible for the protection of industrial heritage in Longford is Waterways Ireland, which was established in 1999 for the management, maintenance, development and restoration of the inland navigable system (rivers and canals), which includes many industrial heritage sites in County Longford.

12.4. Limitations of the present protective legislation and suggested remedies.

Although Longford Local Authorities will have (by 2009) a significant amount of industrial heritage sites listed on the RPS, the process by which this listing has been conducted, and the means of protection itself, has created two significant issues.

Firstly, as stated in the preceding section, the majority of the industrial heritage sites identified for protection have stemmed from the Local Area Plans, which are uniquely concerned with the larger urban areas of County Longford. Thus rural sites, or sites in smaller towns, have correspondingly less chance of being recorded and thus protected. Similarly, sites in smaller urban areas (such as Cloondara or the wider vicinity of Abbeyshrule), which have not been the subject of LAPs, may also be under-represented.

Secondly, the method by which industrial sites are being protected is by way of a listing on the Record of Protected Structures. Whilst this does include upstanding elements of sites such as millraces associated with the mills within the protected curtilages, it does not afford a good means of protection for sites whose remains survive primarily underground. For example, in the case of the tanneries situated outside Longford, Granard and Ballymahon, where no above-ground remains are likely to survive, protection should not depend on the RPS alone. In addition, where most of a site has already been destroyed, additional elements of that site may survive in the vicinity as sub-surface remains. One example is the line of the probable tramway track associated with the Abbeycartron Brickworks, which is still visible although the brickworks site itself is demolished. Protection of such sites (if considered appropriate following site inspection) should be addressed through inclusion in the Record of Monument and Places, which lists archaeological sites.

The fact that only three of the industrial heritage sites in Longford (Abbeyshrule Bridge, Lanesborough Bridge and Elfeet Windmill) are presently afforded some protection through inclusion on the Record of Monuments and Places (RMP) is presumably a function of the way that industrial heritage is seen as a separate issue to archaeological heritage. This perceived distinction is apparent from a perusal of the Local Area Plans that have been produced in Longford in the past four years. This distinction is entirely artificial, and it must be noted that the RMP itself is not limited to

sites pre-dating the year 1700, as is sometimes incorrectly assumed. It is worth quoting the definition of 'historic monument' as it appears in the legislation in full (emphasis mine):

*'Historic Monument' includes a prehistoric monument and any monument associated with the commercial, cultural, economic, **industrial**, military, religious or social history of the place where it is situated or of the Country and also includes all monuments in existence before 1700AD or such later date as the Minister may appoint by regulations'* (National Monuments (Amendment) Act 1987, 1(1), p. 3)

The distinction between the inclusion of a site on the Record of Monument and Places and on the Record of Protected Structures should not therefore be based on the type or perceived date of a monument; rather on the likely forms of the remains, its condition and potential for re-use. Once a monument or feature is considered to be of sufficient interest to protect (whether it is an 18th century windmill or a prehistoric pathway), it should be placed on the RMP in the case of a site which survives primarily below the ground or which is derelict and will not be reused or renovated, or on the RPS if it is still standing and has the potential for re-use. These same points have also been raised during the compilation of the Waterways Studies (Buchanan *et al* 2004).

12.5. Limitations of the present desk-based survey.

12.5.1. In addition to the summary of projected future stages listed in Sections 12.6 and 12.7 below, the following section has been included in this report as the compilation of the desk-based stage of the LIHS has led to the identification of further areas of potential work. These stem not only from areas of interest identified in the course of compiling the Survey, but also from a critical analysis of potential gaps in site identification arising from the nature of the Survey itself. As a result, and in order to clarify where these gaps and research opportunities occur, the limitations of the Survey to date are explicitly outlined below.

The aim of presenting the limitations in this way is to enable the development of general strategies within the different projected stages of future work, that will permit

the effects of those limitations (such as skewed numerical information on sites, or the under-representation of site types in the record) to be overcome.

12.5.2. *Nature of the limitations.*

The use of the First, Second and Third Edition 6-inch scale Ordnance Survey maps as the primary sources for the identification of industrial sites in the Kildare Industrial Heritage Survey (2007) has resulted in an over-representation of certain types of sites over others, and of sites in certain regions over others. Although the use of other cartographic sources (early 19th century pre-Ordnance Survey maps and early 20th century 25-inch scale Ordnance Survey maps), previously existing surveys (e.g. the Record of Protected Structures, Record of Monument and Places and National Inventory of Architectural Heritage) and written sources (e.g. Lewis 1837) led to the identification of numerous additional sites, the fundamental imbalances have not been addressed fully. These imbalances are site-type-based and region-based. They have been addressed in detail in Section 3.0. above, but are summarised here.

12.5.3. *Site-type imbalances.*

Whilst certain types of industrial sites, for example corn-mills, are consistently represented on cartographic sources over the period 1750-1930, others are less consistently represented (for example the cartographic representation of smithies prior to the beginning of the 20th century). Horse-powered industrial sites do not appear to be depicted in the county at all, despite being very common in the 19th century extractive industries elsewhere in Ireland. Changing map conventions have emphasised certain industrial site-types over others, and future work that depends less on cartographic sources should be able to address these imbalances.

12.5.4. *Distribution-based imbalances.*

The reliance on relatively large-scale maps (1:10,560 scale for the 6-inch OS maps), necessary in order to cover the entire county, has led to an emphasis on larger industrial sites at the expense of smaller sites, and an emphasis on industrial sites in rural areas at the expense of sites in urban areas. The former point is less problematic, as even small features such as lime kilns are clearly marked on the 6-inch maps. The compact clustering of industrial sites in urban areas, however, means that the 6-inch

maps often do not mark individual industrial features, emphasising instead the main routes and extent of the built environment. Even at a more detailed scale of 1:2,500 (the 25-inch OS maps) many industrial features are not marked individually. This is perhaps the most serious imbalance in the Survey, but it is also among the easiest to rectify with future work.

12.6. LIHS Project, Phase 2: Further work focussing on Urban Areas.

12.6.1. *Introduction to recommendations regarding future work on urban areas.*

As we have seen, the distribution-based imbalances inherent in the desk-based LIHS study necessitate further work which focuses on identifying industrial archaeology sites in urban areas. To that end, ten Urban Areas have been identified as requiring further investigation, and these are listed below. An initial assessment of the Urban Areas (refer Section 11.1) has allowed an assessment of the relative importance of these, and they have been grouped into three tiers on account of their potential for industrial functions.

The Tier 1 Urban Areas (of which there are four) comprise the larger towns of Longford which have the highest concentrations of industrial features at present and which also have the highest potential for the identification of additional features. Tier 2 Urban Areas (of which there are 6) have significant manufacturing sites, such as watermills, and also have the potential for further sites to be identified. Tier 3 Urban Areas are rural villages and do not offer the same potential for the identification of new industrial sites, and so further work is not recommended on these at this stage.

Tier 1.

**Longford
 Granard
 Edgeworthstown
 Ballymahon**

Tier 2.

**Lanesborough
 Keenagh
 Newtownforbes
 Balinalee
 Cloondara/Cloondra
 Abbeyshrule**

Of the ten towns listed above, eight of these have been the subjects of Local Area Plans (LAPs) which have documented many surviving industrial heritage features of the towns. Although these surveys are for the most part very comprehensive, some industrial features which are unlikely to have left readily identifiable standing remains (e.g. tanneries, creameries, butter markets, demolished mill buildings) have not been included.

Cloondara and Abbeyshrule have not yet been the subject of Local Area Plans (due perhaps to their small size). If LAPs or Village Design Plans are planned for these in the future, it is recommended that these should include a field analysis of extant industrial heritage sites, which at Cloondara includes the Royal Canal (harbour, offices, dry-dock, lock), the Cloondara Canal complex, and the various corn mills, textile mills and distilleries. At Abbeyshrule, the industrial features are situated in a wide area around the town, and these include the Royal Canal, with canal stop, bridges and the Whitworth Aqueduct, and the Clynan Mills complex on the River Inny.

12.6.2. *Suggested format of Urban Assessments.*

Each of the Urban Assessments should involve an extensive walking programme to identify industrial features. This will form the basis of each survey. In some cases the sites will already be included in the LIHS from cartographic and historical sources and previous surveys, but it is expected that many new sites will be identified through the walking programme. A separate tab for field inspection has been included in the current LIHS database to facilitate the recording of information gathered on site, which should include a photographic record. Focused searches of industrial archives and

historical information for each Urban Area should follow. Throughout the process, local historical societies should be involved.

Based on the results of the LIHS survey, most of the urban areas in Longford have associated industrial sites situated a small distance outside of the town (e.g. tanneries, watermills and union workhouses). In some cases, for example Abbeyshrule, the most important industrial sites are located in the wider vicinity rather than in the town centre. Thus the field inspections should also include a targeted inspection of specific sites, previously identified in the LIHS, in the wider area.

The sites identified in the Urban Assessments should be marked on modern 25-inch Ordnance Survey maps, similar to the NIAH, and these should be incorporated into the LIHS database. The system used to number and organise industrial sites which has been established in the county-wide LIHS was created with the eventual Urban Assessments in mind, and is thus capable of being used for these.

12.7. LIHS Project, Phase III: Further recommendations for future work.

12.7.1. *Site inspection of identified industrial sites.*

Following the detailed Urban Assessments, site inspection of the non-urban sites will need to be conducted in order to assess the survival of each identified site and the presence of associated features. As already noted a separate tab for field inspection has been included in the current LIHS database to facilitate the recording of information gathered on site, which should include a photographic record.

It will not be necessary to visit all 3,410 of the sites identified by the LIHS. 2,841 of these sites are small-scale quarries and lime kilns that do not need to be visited, and 317 sites have been previously recorded during the compilation of the Longford Bridge Survey and the NIAH. A further c. 100 sites are situated in urban areas and will be documented in Phase II (see above). This leaves less than 300 sites that may require a field survey.

Many of the sites identified in the LIHS may have no surface traces, and this fact should be investigated and recorded. The assessment of the survival or otherwise of the

industrial features identified in the LIHS will enable the protection of those sites which do survive. The site inspection will also enable the identification of industrial features associated with a site, such as mill-pools and mill-races with watermills, and pumping-towers, processing machinery and tramways with extractive sites, that may not have been marked on the cartographic sources. Detailed site inspection is critical in the case of certain site-types, for example windmills, in order to assess their date and type (see Section 8.4). It should also be possible to assess the date of industrial features based on the site inspection and information from the desk-based assessment.

12.7.2. *Focused regional and site-type based studies.*

The existing LIHS database provides an excellent starting point for further focused studies, on a local or regional scale, or on a specific type of industrial site. Interest in undertaking such studies is likely to originate from academic institutions, local historical societies, the private sector (in the form of the EIS industry) and the public sector. Thus the database should be made available to these groups as a priority in order to encourage this work. The results of such focused studies can be integrated into the overall LIHS database, therefore gradually improving and enlarging the database. Future focused studies may incorporate additional information derived from industrial archives, such as those from private companies and semi-state bodies such Bord na Móna.

One avenue of potential interest may be a comparison of the distribution and location of extractive sites in Longford with the underlying geology. The Geological Survey of Ireland's *Irelithos* project, which analysed the sources of stone used on archaeological monuments, is a good example. The very large number of extractive sites identified in the survey will provide an excellent basis for such a project.

12.7.3. *Publication of LIHS.*

The hope that the LIHS will encourage the further study, and eventual protection, of the material remains of Longford's industrial past will only come to pass if the database is made widely available, in particular to local historical societies and to academic staff and students. The most effective method to publish the database is through the

internet, which will also allow for the constant updating of the LIHS to reflect the contribution of ongoing work. To support online access, the 27 maps that form part of the survey could be linked to the database in a Geographical Information System.

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LDP	2003	Longford County Development Plan 2003-2009, available online.
LDP (draft)	2008	Draft Longford County Development Plan 2003-2009, available online.
NIAH	2008	National Inventory of Architectural Heritage, County Longford. Incomplete database made available to us for the purposes of the LIHS by the DoEHLG.
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RMP	1996	Record of Monument and Places, Archaeological Survey of Ireland (unpublished database, 1996, National Monuments Service, formerly Dúchas, DoEHLG).
RPS	2003	Record of Protected Structures (including 'Mill Buildings of Industrial Archaeological Interest'), tables 5.1 and 5.2, in Longford Development Plan 2003-2009.
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(<http://www.longfordgenealogy.com/history/h4.html>).

National Civil Engineering Database, Trinity College Dublin.

(<http://www.tcd.ie/civileng/research/heritage>)

Inland Waterways Association of Ireland.

(<http://www.iwai.ie>)

National Library of Ireland: Images of railways, also some of canals.

Catalogue (<http://www.nli.ie>)

Longford Local Authorities: Longford development plans (2003 & 2008) and LAPs.

(<http://www.longfordcoco.ie>)

Website of The Industrial Heritage Association of Ireland.

(<http://www.ihai.ie>)

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