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INDUSTRIAL HERITAGE COMPONENT

Of the Waterway Corridor Study for the
River Shannon from Meelick to the Shannonbridge at Limerick, including all of Lough Derg

Carried out by Cultural Resource Development Services Ltd
on behalf of

The Heritage Council

in partnership with Clare, Galway, Limerick and North Tipperary County Councils, Limerick City Council, Shannon Development and Waterways Ireland

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1 Introduction

1.1 Overview

At the request of The Heritage Council, in partnership with Clare, Galway, Limerick and North Tipperary County Councils, Limerick City Council, Shannon Development and Waterways Ireland, Cultural Resource Development Services Ltd have undertaken the industrial heritage component of the Waterway Corridor Study.

For the purpose of the assessment, the study area has been defined as consisting of the River Shannon from Meelick to the Shannonbridge at Limerick, including all of Lough Derg.

The following report comprises the results of a desk-based industrial survey of the area surrounding the waterway and a field survey of the corridor through which it flows.

1.2 Aims and Objectives

The overall aim of the Waterway Corridor Study is:

- To identify ways to manage the waterway corridor environment to the benefit of all, i.e. heritage, land and water-based users.
- To improve understanding of an area, and by this understanding, ensure retention of the distinctiveness of a place, while allowing for development and evolution of use for the future.

The objective of the industrial heritage component of the study is to identify and assess the distinctive aspects of the industrial heritage and to provide an inventory of the extant sites within the Waterway Corridor.

1.3 Desk-based Survey

The principal source of information used in the compilation of the inventory of industrial heritage sites within the waterway corridor was Ordnance Survey maps. The locations of upstanding monuments and captioned sites were recorded from the relevant 6" maps (Co. Clare Sheets 21/21A, 29/29A, 36, 37, 45, 53, 54, and 63/63A; Co. Galway Sheets 108, 109/109A, 118, 126, 127, 132 and 135; Co. Limerick Sheets 1, 5 and 6; Co. Offaly Sheets 21 and 29 and North Co. Tipperary Sheets 1, 3, 4, 6, 7, 9, 13, 14, 19, 25 and 31/31A). For the purpose of the study a corridor of *c.* 500m from either bank of the waterway was defined. This was extended to the nearest ridge line where upland areas bounded the waterway and significant industrial heritage sites outside this buffer were also recorded.

Documentary research was undertaken to identify additional industrial heritage sites within the waterway corridor and to provide supplementary historical data on the sites.

1.4 Field Survey

Sites identified during the desk-based survey were visited to ascertain their survival and sites retaining an upstanding component were photographed and recorded. A survey of industrial heritage sites between Meelick, Co. Galway and Parteen, Co. Clare, including all of Lough Derg was undertaken from the waterway between 22nd to 26th August 2005. Site visits were conducted

at Meelick, Portumna, Mountshannon, Scarriff/Tuamgraney, Killaloe/Ballina, Terryglass, Kilgarvan, Dromineer and Garrykennedy. The waterway corridor from Parteen to Limerick was visited by car and on foot between 19th and 20th October 2005.

1.5 Inventory

The data gathered during the desk-based and field-based surveys is included as an Appendix to this report

The written record includes:

- A unique site number.
- The location of the structure (county, townland and Ordnance Survey 6" sheet number).
- Details of statutory protection (whether included in the Record of Monuments and Places, the Record of Protected Structures and/or the National Inventory of Architectural Heritage).
- A summary account describing the building's type, main construction materials and date as it was apparent from the visual inspection or documentary research.

The written record was supplemented by a photographic record which includes:

- General views of the structure.
- Detailed photographs of external features of industrial archaeological interest.

2 Industrial Development

Structures and buildings relating to inland navigation, road and rail transportation, manufacturing and electricity generation are found throughout the study area.

2.1 Navigations and Canals

The River Shannon, the main waterway in this region, flows in a generally north-south direction through the study area. It figured prominently in proposals for navigation schemes in the late 17th and early 18th centuries though work did not begin on the navigation until mid-18th century. Further works were carried out in the mid-19th century to improve the navigation.

2.1.1 The Clonahenogue Canal

The Commissioners of Inland Navigation appointed Thomas Omer as engineer on the River Shannon in the mid-18th century. Omer commenced navigation works in the middle reaches of the river (Delany 2004, 48). Obstructions at four locations along this stretch, including Meelick, were by-passed (Delany 2004, 48). A lateral canal, the Clonahenogue Canal was constructed to bypass the extensive rapids at Meelick. The now disused canal is c. 3km in length and is located to the east of Incherky Island. A single lock, Hamilton Lock, constructed of ashlar limestone with timber lock gates, was constructed at the southern end of the canal. The lock was controlled from a three-bay, single-storey lock keeper's house on the east bank of the river. A report of 1759 indicates that work on the middle Shannon was completed.

In 1783 Richard Evans was asked to report on the state of the navigation upstream of Killaloe. The very poor condition of the lock at Meelick was recorded in Evans's report and reiterated in Chapman's report of 1791 (Delany 2004, 51). The deterioration of the lock meant that boats were being hauled up the river instead of the canal (Delany 2004, 53). The lock was rebuilt by the Grand Canal Company in the early 19th century.

The Shannon Commissioners took over control of the Shannon navigation in 1835 and provided money for the repair and upgrade of the whole navigation. Thomas Rhodes, the commissioner's engineer, proposed the abandonment of the Clonaheenogue Canal and Hamilton Lock at Meelick and they were replaced in the 1840s. The new stretch of canal was less than 1km in length and ran further west of the old navigation. A large lock was constructed at the southern end of the canal. Victoria Lock, which has an ashlar limestone lock chamber, was much larger than its predecessor and was constructed to accommodate the large steamers which had arrived on the Shannon in the 1820s (see below). The three-bay single storey lock keeper's house, located on the eastern edge of the canal, is constructed of dressed limestone with a projecting plinth course and string course.

Victoria Lock, Meelick.

Lock keeper's house, Meelick.

2.1.2 The Limerick to Killaloe Canal

The development of the Shannon Navigation to the south of Lough Derg was problematic as the majority of the river's fall is between these two locations (Delany 2004, 50). The Commissioners placed William Ockenden in charge of construction and work commenced on the southern end of the navigation in June 1757 (Delany 2004, 50). In 1767 the Limerick Navigation Company was incorporated by an act of parliament and further money was sought to undertake the works (Murphy 1980, 46). Following the introduction of the debenture scheme in the 1780s the company applied for a loan and estimated that £24,000 was needed to finish the works on the navigation. Engineer William Chapman was consulted on the state of the navigation in 1791 and reported a number of problems including the different sizes and designs of locks used. Chapman remained with the company, laying out the line of the canal at Killaloe and carrying out remedial works at a number of the locks (Delany 2004, 51). Works were finally completed in 1799 and trade on the river commenced.

The loop in the Shannon immediately north of Limerick was by-passed by means of an artificial canal, known as the Park canal. The navigation infrastructure dates to the mid-18th century and includes the 1st Lock and Park Lock both constructed of ashlar limestone masonry and two bridges. While the bridges are both of single-arch design the 1st Lock Bridge is constructed of red brick while Park Bridge is constructed of squared rubble limestone. Of particular interest is the milestone located between the Shannon and the Park Lock. It is a triangular-profile milestone inscribed with the distances to both Limerick and Killaloe. The Park Canal is currently undergoing extensive redevelopment as a cycling and walking route between the city and the University of Limerick.

Ist Lock Bridge, Park Canal, Limerick.

The second artificial cut, with six locks (Annabeg lock, Gillogue lock, Newtown lock, Clonlara lock, Monaskea lock and Errina lock) was planned to avoid the falls at Castleconnell and Doonass. A short artificial cut with three locks (Cussane lock, Moys lock, and Killaloe lock) was constructed to

avoid the falls and eel weirs at Killaloe (Murphy 1980, 52). The commissioning of the Hydro-Electric Power station at Ardnacrusha led to changes in water levels in the canal at Errina and Killaloe. The section of canal at Errina, in particular, is dewatered and derelict in parts and many of the locks are inaccessible.

Milestone, Killaloe Canal.

Slip and crane, Kilalloe Canal.

2.2 Steam Navigation

The first attempts to introduce steam powered vessels on this section of the navigation was made in April 1815 when R.D. Watson wrote to the Directors General of Inland Navigation suggesting the use of a steamboat (Murphy 1984, 45). While the Directors General of Inland Navigation did support the venture they decided not to fund it while the navigation was still incomplete. The use of steamboats was again suggested in the 1820s by John Grantham and in 1824 the Directors General of Inland Navigation agreed to support his venture (Griffin 1995, 33). Grantham was granted a plot of land in Limerick to build a store for the use of his Steamboat Company and Grantham's boat, the 'Marquis Wellsley', appears to have been the first steamer to arrive on the Shannon c. 1825-6 (Griffin 1995, 33). Steam navigation introduced cheaper and more efficient travel on the Shannon and Killaloe became the headquarters of the Inland Steam Navigation Company. In 1833 the Inland Steam Navigation Company introduced the 'Lady Lansdowne' the largest steamer to work on the Shannon (Griffin 1995, 34). The steamer was constructed at the Birkenhead Iron works and was shipped to Ireland in sections before being reassembled in Killaloe. When the steamer went out of use it was laid up near the site of the present marina at Ballina (Griffin 1995, 34). The 1840s were boom years for steamboat use but were followed by a period of decline resulting from the famine and the development of the rail network (Griffin 1995, 35). In 1851 trading on the Shannon was taken over by the Grand Canal Company and the passenger service was further curtailed. Competition with steamers introduced by the Midland Great Western Railway Company put the Grand Canal Company out of business by the mid 1860s and a number of other steamers were laid up at Killaloe. The Shannon Development Company was founded at the end of the 19th century and re-introduced regular passenger services on the river in 1897 (Griffin 1995, 35). The Shannon Development Company were responsible for the construction of the Lakeside Hotel on the bank of the Shannon above Ballina which opened c. 1900.

2.3 Lough Derg Quays

The steam packet companies were responsible for the construction of many of the quay and harbour facilities now found on the banks of the Shannon and Lough Derg. In many locations the infrastructure is still in use as public mooring for pleasure craft and other users of the waterway. Portumna was the major centre at the north end of Lough Derg and there were two small habours used for transferring people to the larger lake steamers. Connacht Harbour is a small stone-lined harbour constructed on the west bank of the river. The harbour is now used as a hire-craft marina. It retains a number of industrial features including a well-maintained cast-iron crane and some storage buildings. A second harbour is located on the east bank of the River Shannon. The harbour was constructed c. 1828 and a saw mill and hotel were developed alongside it.

There were two quays in close proximity at Kilgarvan and Mota on the east shore of Lough Derg. Kilgarvan Quay, a rubble limestone built quay was a collection point for barley for shipping to the maltings in Banagher (Delany 1987, 174). The remnants of a cast-iron crane are visible on its west side. The quay is lined by goods shed with rendered and painted walls and single-span corrugated iron roofs. Mota Quay which was located in the adjacent townland was constructed by the Inland Steam Navigation Company.

Kilgarvan Quay.

At Williamstown the Inland Steam Company made a harbour with a rubble stone pier in the late 1820s. A hotel was constructed by the company immediately to the west of the harbour. The hotel closed in the 1860s when the steamers ceased to use the Shannon. The harbour is now used as a hire-craft centre and there is a new public harbour at Dromaan immediately to the south.

Williamstown Pier.

A quay was in existence at Dromineer by the early 1800s. Following the construction of a new pier in 1828 Dromineer became one of the principal stations of the Inland Navigation Company.

Services were further extended when the Grand Canal Company constructed a three-bay, single-storey canal store at Dromineer in the mid-19th century which still stands on the edge of the quay. A small pier was constructed at Mountshannon for the purpose of landing the rich marls dredged from the lake bottom (Delany 1987, 195). Lewis records that vessels of '20 tons' burden' could unload there in the 1830s. The modern harbour at Mountshannon is the centre of a thriving sailing club.

The earliest quay in the vicinity of Scarriff and Tuamgraney was on the north side of Scarriff Bay. This was replaced in 1829 by a new quay, named Reddan's Quay, constructed on the Scarriff River. A small laneway extends from it to Tuamgraney (Delany 1987, 198). In the mid-19th century the Shannon Commissioners dredged the river and were able to extend the navigation upstream and a new harbour was constructed at Scarriff. The harbour served as a distribution point for goods being transported by barge down the Grand Canal from Dublin into the River Shannon, through Lough Derg and up the Scarriff River.

On the opposite side of the lake is a small harbour at Derry Castle. It was constructed by the Inland Steam Navigation Company for shipping slates from the slate quarries at Tountinna (Delany 1987, 200). The harbour at Garrykennedy was constructed by the Steam Navigation Company in 1829 for shipping slate from the Irish Mining Company mines in the Arra Mountains (Delany 1987, 192). The excavation of the harbour isolated Garrykennedy Castle (TI013:001). The walls of the harbour are constructed of square limestone blocks and local tradition has it that some of the building stones from the castle were used in its construction. A modern harbour with floating pontoons was recently completed to the north.

Garrykennedy Harbour.

The company were responsible for developing much of the infrastructure still visible at the pierhead to the north of the bridge at Killaloe including a station, stores, workshop and dry dock and were

also responsible for the construction of an inn, The Ponsonby Arms, in the town. Passengers alighted from the larger lake steamers at their station at the pierhead before transferring to the smaller boats of the Limerick Packet Company at their station immediately below the bridge (Delany 1987, 208).

2.4 Road and Rail

Bridges of industrial heritage interest are found at a number of locations on the River Shannon and other waterways running though the study area.

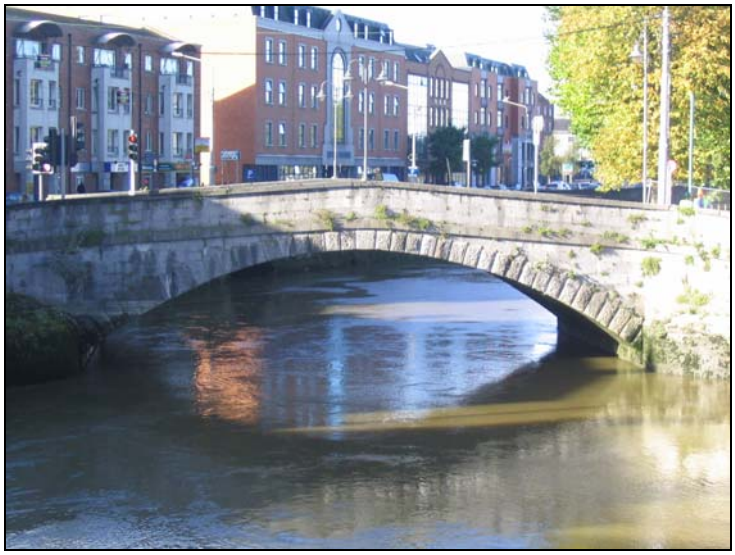
The town of Portumna is located at the point where the Shannon narrows above Lough Derg. The earliest bridge was constructed by Lemuel Cox in 1795 and was subject to phases of rebuilding in the following century. The construction of the current bridge was completed in 1911. The bridge is constructed in two spans separated in the centre by Hayes' Island. A swing bridge near the western bank of the river allows navigation between the Shannon and Lough Derg. A mid-19th century bridge operator's house survives on Hayes' Island.

The bridge at Killaloe is located where the river narrows to the south of Lough Derg. The current bridge was constructed during the early 18th century and has been subject to many phases of rebuilding in the intervening centuries. A navigation was added to the centre of bridge c. 1929 to facilitate river traffic, according to Kierse this was a swivel bridge but was only opened once for testing. The bridge is constructed of rubble limestone with ashlar limestone cutwaters and voussoirs.

Killaloe Bridge.

The bridging of the River Shannon at Limerick was of strategic importance to the development of the city and its hinterland. The first bridge on the river, the old Thomond Bridge, was constructed to link the city to Clare and the counties beyond in the early 13th century. The medieval 14-arch bridge stood until the late 1830s. The modern 7-arch bridge was constructed by Limerick Corporation between 1836 and 1839. The bridge has segmental arches and is constructed of

squared limestone masonry. Sarsfield Bridge is the earliest standing bridge on the Shannon at Limerick. Designed by Alexander Nimmo the five-arch bridge was constructed between 1824 and c. 1831. The bridge has segmental arches and rounded cutwaters and is constructed of ashlar limestone. At the time, lock gates and a proposed weir were not installed, so boats used the lie-by and passed through the open lock and swivel bridge to access the quays above it. Lock gates were finally fitted and a weir constructed in 2001 as part of the Limerick main drainage and navigation scheme. The Abbey River is also spanned by a modern bridge on the site of a medieval one. A medieval four-arch bridge, Baal's Bridge, is recorded on the river and was replaced c. 1831. The bridge has a single segmental arch and is constructed of ashlar limestone. Mathew Bridge, a three-arch bridge, also spans the Abbey River. The bridge has segmental arches with rounded cutwaters and is constructed of ashlar limestone.



Baal's Brigde, Limerick.

The waterway corridor is currently served by two railway lines, that running from Limerick to Dublin (via Nenagh) and that from Ennis to Dublin (via Limerick Junction).

The introduction of rail services to Limerick city in the 19th century was a source of some rivalry between railway companies competing for the profitable business of servicing the important marine and industrial centre. The largest Irish railway at the time was the Great Southern & Western Railway (GS&WR) who, from its inception, had planed a route to Limerick. However, The Waterford and Limerick Railway (W&LR) reached Limerick first, opening the section of its line between Limerick and Tipperary on 9 May 1848. For eight years Limerick was served exclusively by the W&LR and was to become the hub of the company's business as later on it worked trains for three companies to Foynes, Ennis and Killaloe (Doyle & Hirsch 1983, 25-6; Mulligan 1990, 51, 55).

Meanwhile, the GS&WR was constructing its mainline from Dublin to Cork which had opened as far as Borris and Roscrea Station (now Ballybrophy) in 1847 (Doyle & Hirsch 1983, 23). Lord Ross of Birr Castle promoted a scheme for the Roscrea & Parsonstown Junction Railway (R&PJR) to build a line linking the town to the GS&WR, who supported the scheme as they saw it as a means of

reaching Limerick. The 10¼ mile Ballybrophy-Roscrea section opened in October 1857 and the remaining 12 miles to Parsonstown in March of 1858. By that time the R&PJR had been taken over by the GS&WR. With the existence of the Ballybrophy – Roscrea section and the Limerick to Killaloe line, only 32¼ miles of line were now needed to join the GS&WR at Roscrea with the Limerick & Castleconnell Railway at Birdhill, thereby giving the GS&WR a route into Limerick. Powers for the connection were granted and the first section, Roscrea to Nenagh, was opened on 5 October 1863, the remainder opening on 1 June 1864. From that time trains running from Limerick to Nenagh were jointly operated by the GS&WR and the W&LR in an uneasy alliance (Doyle & Hirsch 1983, 23; Mulligan 1990, 51).

The Limerick - Killaloe line was owned by the Limerick & Castleconnell Railway. The 5km Killaloe – Birdhill extension was opened on 12 April 1862. It was a single line on the 5 ft. 3ins. gauge. In 1867 the line was extended a further 700 metres to a wharf beyond Incha Hill, on the site of the present Lakeside Hotel, to serve the trade boats and steamers on the Shannon. In 1894 a new station house was built north of the bridge. In 1858 they were advertising a rail and steamer ticket from Broadstone Station in Dublin to Limerick, travelling by train to Athlone and then by boat to Killaloe with a horse bus completing the journey to Limerick. Although the journey took 11½ hours, 4 hours more than travelling with the GS&WR, passengers may have been tempted by the lower fares (Mulligan 1990, 69). Daily train services ran from Killaloe to Limerick as well as Sunday excursions from Limerick and Nenagh. Regular passenger services ceased in 1931 but excursion trains continued for a time afterwards. The last train left in August 1948 pulling derelict wagons to Birdhill (Kierse 1999, 47).

Work began on the Parsonstown (now Birr) and Portumna Bridge Railway, a 19km line linking Birr, Co. Offaly with the east bank of the Shannon at Portumna, Co. Galway in 1863. The main construction contractor went bankrupt and the line was not opened till 1868. The GS&WR made an agreement to work the line but following a number of disputes traffic ceased in 1878. The infrastructure of the line was removed by the company's creditors including the station at Portumna Bridge and the line became known as 'the stolen railway' (Share 2003, 1021).

The Limerick to Ennis Railway received its Act in 1853 but took six years to complete the section of line from Clarecastle to Longpavement which opened on 17 January 1859. Services between the intended termini of the line depended on the completion of bridges over the River Shannon at Limerick and the River Fergus near Ennis. On 26 March 1859 trains ran through to Limerick but the line was not completed until the Fergus Bridge opened on 1 July. The entire line was worked by the W&LR (Doyle & Hirsch 1983, 26).

A standard gauge rail-link was constructed from Longpavement line to Ardnacrusha to aid in the movement of materials and machinery that were needed during construction (Duffy 1990, 14). The contract for the construction of the power station was granted to the German firm, Siemens Schuckertwerke, which subcontracted the civil engineering to Siemens Bau-Union (Doyle & Hirsch 1983, 188). Most items used in the construction work were imported from Germany through Limerick docks and brought to Longpavement and transferred by rail to the site (Duffy 1990, 15). No less than 110 locomotives and 3,000 wagons were used, operating on two gauges, 600 and 900mm (Doyle & Hirsch 1983, 189). The standard gauge line was supplemented by approximately 100km of narrow gauge railway which could be repositioned as construction of the head- and tail-races progressed (Duffy 1990, 15).

2.5 Power Generation

The Shannon Hydro-Electric scheme dominates the landscape to the south of Killaloe. The harnessing of the River Shannon as an energy resource was proposed as early as the mid-19th century (Duffy 1990, 1). This scheme and others formulated in the late 19th and early 20th centuries were rejected due to various economic and engineering concerns. The inception of the scheme to harness the Shannon for hydro-electric power can be linked to the arrival of an Irish scientist and engineer, Dr. Thomas A. MacLoughlin, at the firm of Siemens-Schuckertwerke in Berlin (Duffy 1990, 5). While employed at the company MacLoughlin developed his ideas for the Shannon scheme and managed to interest the Irish Government in his proposals. Siemens-Schuckertwerke submitted detailed proposals which were vetted by four international experts (Schronbenhauser 1930, 4). The experts recommended the adoption of the general scheme subject to certain modifications (Duffy 1990, 5). The Shannon Electricity Act, enabling the construction of the Shannon Hydro-Electrical Scheme, was passed by the Oireachtas in June 1925 and a contract was signed between the government and Siemens-Scheckertwerke to undertake the work (Duffy 1990, 5). Construction of the power station at Ardnacusha and its associated infrastructure commenced in 1925 and was completed within three and a half years at a cost of £5.2 million (Duffy 2004, 24). The aim of its construction was to provide for the electrification of the recently independent Irish Free State (Duffy 2004, 24).

A weir was constructed at Parteen which raised the water level in the river by 7.55m to that of Lough Derg and ensured the entire fall between Killaloe and Limerick could be harnessed to drive the turbines at the power station (Cox 1998, 272). The raising of the water levels created a large artificial lake south of Killaloe which submerged much low-lying ground on the banks of the river. The level of the Shannon was raised over a distance of 8km necessitating the construction of banks to protect the surrounding land from flooding (Schronbenhauser 1930, 4). Banks were also constructed between Portumna and Meelick to prevent flooding above Lough Derg during heavy rainfall (Schronbenhauser 1930, 4). St. Lua's Oratory, which was located on Friar's Island within the flooded area, was removed and rebuilt on the site of the Roman Catholic Church in Killaloe (Duffy 1990, 8). The intake, constructed adjacent to the weir, controls the flow of water into the head-race canal and hence into the power station.

Intake at Parteen.

The head-race canal was constructed to convey water from the weir and intake at Parteen to the power station at Ardnacrusha, a distance of 12.6km (Duffy 1990, 9). The design of the head-race had to incorporate both the delivery of water to the power station and the facilitation of navigation (Duffy 1990, 9). Material excavated from the head-race was used almost entirely for building the embankments which reach a maximum height of 18m (Schronbenhauser 1930, 8). Other civil engineering works involved the construction of the three reinforced concrete suspension bridges over the head-race at O'Briensbridge, Blackwater and Cloonlara to accommodate local traffic (Duffy 1990, 9).

Bridge over the head-race at O'Briensbridge.

The power station, located at the south end of the head-race canal, consists of a large intake sluice building controlling water flow into the penstocks, which lead to the turbines in the generating building (Duffy 2004, 24). Water from the turbines is discharged via draft tubes into the tail-race which leads back into the River Shannon at Parteen-a-Lux (Cox 1998, 272). As all the navigation traffic had to pass from the head- to the tail-race, a large navigation lock was constructed next to the overflow channel (Schronbenhauser 1930, 10). The lock is a double one with a combined drop of 34m and boats exit into a specially designed navigation channel which re-enters the tail-race downstream of the power station (Duffy 2004, 25). The tail-race is 2.4km long and was constructed to carry water from the power station back into the River Shannon. It is cut from solid rock and is spanned by one bridge at Parteen (Duffy 1990, 12).

The Shannon Scheme, one of the largest civil engineering projects of its time, was officially opened in July 1929 by W. T. Cosgrave (Duffy 1990, 23). The project had a major impact on the development of the national electricity grid and rural electrification. The significant impact of the project was recognised in 2003 when Ardnacrusha received an International Milestone Award and the International Landmark Award from the American Society of Civil Engineers.

2.7 Limerick

Limerick was the only settlement within the study area that supported large-scale industry. Limerick's advantages for industry included the proximity of the River Shannon which could be harnessed for water power and as a communication routes and the development of Limerick Docks. Of particular importance in the 19th century were industries related to food processing and clothing manufacturing (Jacobs and Lee 2003, 6-16).

2.7.1 Limerick Docks

The suitability of Limerick's location as a trading port played an important role in the city's early development and the role of Limerick Docks was significant in its commercial and industrial development in the modern period. Prior to 1760 port activity was concentrated along Merchants Quay, Long Dock and the confluence of the Abbey River and Shannon (Jacobs and Lee 2003, 93). As trade developed the facilities were found wanting and local merchants required additional and improved quays (Jacobs and Lee 2003, 93). The development of quays on newly reclaimed land is evident in the late 18th century. The Custom House and its adjoining quay were completed in 1768 and Arthur's Quay was completed in 1773 and by the early 19th century a series of private quays extended downstream of the city to O'Curry Street (Jacobs and Lee 2003, 93). Local traders still regarded the harbour facilities as inadequate in the mid-19th century and there was no dock where ships could remain afloat at low tide (Jacobs and Lee 2003, 96). Parliament accepted the case for a floating dock in October 1846 and the necessary legislation was passed 1847 to allow the works to commence (Jacobs and Lee 2003, 97). The 'Wet' or 'Floating Dock' at Limerick was constructed between 1849 and 1853 under the supervision of the Limerick Harbour Commissioner's engineer, John Long (Rynne 2005, 3). It was extended to the west between 1937 and 1956 (Fallon 2005, 4). It consists of a large rectangular dock c. 420m east-west by 140m north-south. The walls of the dock are constructed of limestone blocks with limestone coping stones. The expansion of the port created the need for a graving dock to facilitate ship repair and maintenance and work on it was completed in 1873. The sides of the dry-dock comprise cut stone steps. When the gates were opened the dock would fill with water and the boats could be floated in. The gates were then closed and sluices opened to drain water from the dock to allow work to be undertaken on the craft's hull.

2.7.2 Milling

Flour milling was a long established industry in Limerick dating back to at least the 13th century. Significant flour mills developed in the 19th century including Bannantyne Mills on Dock Road and John Norris Russell's Mills at Henry Street and his Lock Mills at the junction of the Abbey River and the Park Canal (Jacobs and Lee 2003, 14). Plassey Mill, located on the banks of the Shannon immediately north of Limerick, was built between 1823 and 1824 by the Hedges-Maunsell family. The primary consideration in the location of the mill was the existence of a reliable and constant water source. In the mid-19th century control of the mill passed to Richard Russell who proceeded to modernise the mill and it became one of the most significant mills on the Shannon. It had fallen into disuse by the late nineteenth century and was partially demolished in the mid-20th century. Contemporary photographs of the mill show a large building of at least six bays and six storeys with a tall stair tower at the north-corner. The remains lie immediately adjacent to Plassey Bridge opposite the entrance to the Errina section of the Limerick Killaloe navigation. It is constructed of squared limestone rubble with red brick inclusions. The west wall of the tower has been demolished and the remains of the stone spiral staircase are visible. The millrace constructed to power the site was long and wide in order to make the most of the 3 metre (10 ft) drop in the river

between Bohogue and Drominveg (Rynne 1999, 3). For most of its length it runs through the grounds of the University of Limerick and is faced in well cut stone where it re-enters the Shannon below the mill.

One of the significant reminders of the importance of the milling industry in Limerick is The Granary. This important Limerick landmark was constructed c. 1787 by Philip Roche (Kemmy 1992, 5). In the 19th century the granary passed into the hands of Thomas Kelly; it was converted into a bonded warehouse and used for the storage of spirits, wine and tobacco and continued in use till the 1970s (Kemmy 1992, 6). The building consists of a four-storey grain store, constructed of squared rubble limestone. The windows are segmental-headed with red brick surrounds. The building has been sensitively adapted and is home to a number of different services.

2.7.3 Clothing Manufacture

By the mid-19th century the city was an important centre for the manufacturing of clothing. Peter Tait arrived from Scotland to work in a drapery firm and went on to revolutionise the Irish textile industry (Jacobs and Lee 2003, 16). Tait set up a small premises off William Street and a factory to mass-produce army uniforms and within a short while was supplying the British Army (Jacobs and Lee 2003, 16). He moved the manufacturing to a larger premises, on the site of the former army barracks in Lord Edward Street, which could accommodate 1,500 workers. At the outbreak of the Crimea War in 1853 Tait's was the largest producer of army clothing in the world.

2.7.4 Sand Extraction

Up to the time of the building of the power station at Ardnacrusha the majority of sand used in the building trade in Limerick was dredged from the Shannon. Flooding on the Mulcaire, Newport and Clare river's deposited sand in the river below Plassey Bridge and in the stretch of the river between Island Point and the Lax Weir. Sand was removed from the river by means of a hand winch and deposited into a sand barge or cot. The sand was unloaded from the barge at the Sandmall. The dredging area at Island Point was abandoned and from then on the majority of dredging work was carried out at Plassey with the sand unloaded at the harbour near Lock Mills. The scale of material needed for the construction of the Hydro-Electric Scheme at Ardnacrusha led to the introduction of large scale sand pits in counties Limerick and Clare and meant a decline in the traditional dredgings in the River Shannon.

2.8 Significant Rural Industries

2.8.1 Ironworking

Iron working flourished in the area around Whitegate, Woodford, Scarriff, Tuamgraney, Feakle and Tulla during the 17th and early 18th centuries (Madden 1997, 48). Bog iron was extracted from shallow open-cast mines on the eastern slopes of the Sliabh Aughty Mountains near Feakle, Tuamgraney, Tulla and Whitegate (Madden 1997, 49). The dense oak woods which once carpeted the area were exploited to provide wood for the manufacture of charcoal which was used in the smelting process. The evidence for these once extensive forests is reflected in the frequency of placename elements including doire (oak wood) and coil (wood). The town of Woodford, in Irish 'Graig Na Muilte Iarrainn', meaning the village of the iron mills, was a centre of ironworking and many of the buildings in Woodford were built as housing for the workers or to provide services. Iron working in the Scarriff area is recorded as early as 1633 when the castle and ironworks of 'Skarruff' along with surrounding land were sold to Richard Boyle by Luke Brady of Tuamgraney

(Madden 1997, 49). The ironworks was located to the north of Scarriff though no trace of the structures is visible today.

2.8.2 Slate quarrying

Deposits of good quality slate in the mountains and hills around Killaloe led to the development of a slate quarrying industry by at least the mid-18th century. Arthur Young recorded the presence of formal quarrying operations in his 'Tour of Ireland 1777' and described slates extracted from the quarries in the hills above Derry which were 'sent by the Shannon to distant parts of the kingdom'. Small pits were worked from the mid-18th century by local owners and commercial exploitation did not begin till the early 19th century. John Grantham's map of Lough Derg depicts a number of slate quarries in the vicinity of Killaloe and Ballina. While there are only three slate quarries depicted on the first edition Ordnance Survey maps of the area at Tomlough, Corbally and Garrybeg, this number had increased to seven by the beginning of the 20th century. Corbally quarry was worked by the Mining Company of Ireland between 1826 and c. 1841 when it was taken over by the Imperial Mining Company. Along with Corbally the company worked a number of other quarries in the Killaloe regions including the Gap in Cloneybrien townland (Daly 2000, 44). The Corbally quarry subsequently passed into the hands of the Killaloe Slate Company which belonged to the Smithwick family who were already running the Garrybeg quarry in the townlands of Curragh and Corbally.

The first half of the 19th century was a period of intensive activity and it is recorded that 'about 100,000 tons are annually raised for the supply of the surrounding countryside to a great distance (Lewis Vol. 2 1837, 122). By the 1840s over 700 people were employed in the numerous slate quarried in the area and entire communities had grown up in the vicinity of the quarries (Daly 2000, 44). The slate was transported by horse and cart and by boat from the quays at Derry, Garrykennedy and Killaloe while much of the finished slate would have been transported from Killaloe by means of steamers (Daly 2000, 43-4). After 1863 the slate was predominantly transported by rail from Nenagh (Daly 2000, 44). The remnants of the once thriving industry, including the quarries and associated structures are evident thoroughout the Arra Mountains to the northeast of Ballina.

3. Statutory Protection

The statutory protection of industrial heritage sites is governed by two principal pieces of legislation namely the National Monuments Acts and the Planning and Development Acts (Hamond and McMahon 2002, 33).

3.1 The National Monuments Acts

The principal National Monuments Act, 1930, and subsequent amendments (1954, 1987, 1994 and 2004) provide the formal and legal mechanisms to protect monuments and places of special heritage interest, including those of industrial heritage interest, within the waterways. A number of statutory protection mechanisms are contained in these acts including the inclusion of monuments and places in the Record of Monuments and Places (RMP). The RMP consists of a list of monuments and places of special heritage interest within the State and sites included in the RMP are afforded a level of statutory protection.

3.2 Planning and Development Act 2000

The Planning and Development Act 2000 made it compulsory for local authorities to list sites of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest in the Record of Protected Structures (RPS) included in the development plan. Sites included in the RPS are afforded a level of statutory protection in the planning process.

3.3 The National Inventory of Architectural Heritage

The Architectural Heritage (National Inventory) and Historic Monuments Miscellaneous) Act 1999 provides a statutory basis for the National Inventory of Architectural Heritage. The inventory is a systematic programme of identification, classification and evaluation of the architectural heritage of the State. The Minister is currently using the Inventory as the basis for making recommendations for inclusion in the RPS.

3.4 Protected sites

A total of 24 industrial heritage sites within the study area are included in the Record of Monuments and Places, the Record of Protected Structures and/or the National Inventory of Architectural Heritage (Interim County Surveys have been published by the NIAH for Offaly and North Tipperary only). The sites are listed below:

	RMP	RPS	NIAH
Hamilton lock, Meelick			X
Lock Keeper's House (Hamilton Lock), Meelick			X
Victoria lock, Meelick			X
Harbour, Portland Td.			X
Portumna Bridge, Portumna	X	X	X
Bridge Operators House, Portumna Bridge, Portumna			X
Grand Canal Store, Dromineer			X
Garrykennedy Quay			X
Killaloe Bridge	X	X	X
O'Briensbridge, River Shannon	X	X	
Lisnagry Mill, Limerick		X	
Railway Station, Castleconnell		X	
Mill and millrace, Plassey, Limerick	X	X	
Plassey Bridge, Plassey, Limerick		X	
Sarsfield Bridge, Limerick		X	
Bannantynes Mill and Silo, Dock Road, Limerick		X	
National Rusks, Dock Road, Limerick		X	
The Granary, Limerick		X	
Water mill, Limerick	X	X	
Weir, Limerick	X	X	
Harbour and goods store, Portumna		X	
Scarriff Dock, Scarriff		X	
Scarriff Bridge, Scarriff		X	
O'Briens Bridge, Headrace Canal		X	

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Appendix 1

Industrial Archaeological Sites and Monuments within the Waterway Corridor

The following industrial archaeological sites lie within the waterway corridor. They have been primarily recorded from the third edition of the 1:10,560 Ordnance Survey sheets (Co. Galway, Co. Limerick, Co. Clare, Co. Offaly, Co. Tipperary).

No. Townland 6" Sheet No.	Classification Description to include listed status of monument.

River Shannon/Lough Derg sites listed from north to south:

NO. Clonahenoge Offaly 29	Canal Clonahenoge Canal is a lateral canal, c. 3km in length, constructed as part of the Shannon Navigation Scheme by Thomas Omer in the c. 1755. Located to the east of Incherky Island. Crossed by Kilscragh Bridge and Allens Bridge. One lock (Hamilton Lock) used to by-pass the falls at Meelick (see below). NIAH Ref. No. 14929010; NIAH Regional Rating

NO. Clonahenoge Offaly 29	Lock Hamilton Lock constructed as part of the Shannon Navigation Scheme by Thomas Omer c. 1755. Ashlar limestone walls to chamber and timber lock gates. The lock was rebuilt by the Grand Canal Company in the early 19th century. NIAH Ref. No. 14929010; NIAH Regional Rating

No. Clonahenoge Offaly 29	Lock House Three-bay, single-storey lock keeper's house at Hamilton Lock constructed as part of the Shannon Navigation Scheme by Thomas Omer 1755 (from date inscription to interior of entrance door). Rendered walls and modern tiled roof. Square-headed opening with timber door in project porch to centre of façade. Square-headed openings with stone sills and replacement windows. NIAH Ref. No. 14929009; NIAH Local Rating

NO. Clonahenoge Offaly 29	Canal Stretch of canal, c. 0.75km in length, constructed as part of the new Shannon Navigation Scheme in the 1840s to replace the earlier Clonagenoge canal. Not listed

NO. Clonahenogue Offaly 29	Lock Victoria Lock was constructed as part of the new Shannon Navigation Scheme in the 1840s. This large lock was constructed to allow the passage of large steamers which had begun to use the Shannon Navigation. The walls of the lock are constructed of well-dressed limestone and its name is carved on the upper section of the east wall. It was built by the Shannon Commission engineer, Thomas Rhodes. Cast-iron mooring bollards with 1844 date stamp. Lock is now controlled from a modern control house on the west side of the lock. NIAH Reg. No. 14929013; NIAH Regional Rating

NO. Clonahenogue Offaly 29	Lock House Three-bay single-storey lock keeper's house, located adjacent to Victoria Lock as part of the new Shannon Navigation Scheme in the 1840s. Constructed of well-dressed limestone blocks with projecting plinth and string course. Hipped roof with two dressed stone chimney stacks. Square-headed openings with stone sills and timber six-over-six sash windows. Entrance

	door in projecting porch to centre of façade. NIAH Reg. No. 14929012; NIAH Regional Rating

No. Portland Little Tipperary 4	Harbour Harbour located on the east bank of River Shannon to north of Portumna Bridge. Constructed of roughly dressed limestone blocks c. 1828. Saw mill shown on east side of harbour on 1903 edition, no longer in use. NIAH Reg. No. 22400407; NIAH Regional Rating

No. Lehinch, Fairyhill Tipperary 3, Galway 127	Bridge The first bridge at Portumna was constructed by Lemuel Cox in 1795 and was subsequently rebuilt in 1818 and in 1834. The construction of the current bridge, designed by C. E. Stanier of London to the specifications of Tipperary North Riding County Surveyor J.O. Moynan, was completed in 1911. The bridge spans two channels separated in the centre by Hayes Island. Each channel is spanned by three pairs of mild steel girders on cast-iron cylinders. The abutments on the opening span are constructed of ashlar limestone masonry and are retained from the 19th century bridge. There is a swing bridge at the west end of the bridge to allow navigation access (Cox 1998, 218-9; O'Keeffe & Simington 1991, 2634). NIAH Reg. No. 22400301; NIAM Regional Rating

No. Hayes' Island Tipperary 3, Galway 127 Regional Rating	Bridge Operators House Located on Hayes' Island in the centre of Portumna Bridge. Three-bay, single-storey house built c. 1845. Dressed limestone walls with projecting plinth course. Hipped natural slate roof with stone chimneystack to centre. Entrance in projecting porch in centre of façade. Square-headed openings with stone sills and timber two-over-two sash windows. NIAH Reg. No. 22400303; NIAH Regional Rating

No. Terryglass Tipperary 6	Quay Terryglass Quay, Stone built quay c.1820. Not listed.

No. Kilgarvan Tipperary 6	Quay Kilgarvan Quay is a rubble limestone built quay, c. 1830. The quay was used as a collection point for barley for shipping to the maltings in Banagher and the remnants of a cast-iron crane are visible on its west side. The quay is lined by goods shed with rendered and painted walls and single-span corrugated iron roofs. Not listed.

No. Dromineer Tipperary 14	Quay Dromineer Quay is a rubble limestone-built pier constructed c. 1829. Canal store constructed on the quay c. 1850 (see below). Modern quay constructed at the site c. 1991. Not listed.

No. Dromineer Tipperary 14	Canal store The three-bay, single-storey former canal store at Dromineer was constructed by the Grand Canal Company c. 1850. Single span pitched slate roof with red brick chimney stack and overhanging eaves. Snecked limestone walls. Square-headed openings with red brick block-and-start surrounds and timber six-over-six sash windows. The central opening is square-headed and contains large timber sliding doors. NIAH Reg. No. 22401415; NIAH Regional Rating

No. Youghal Village Tipperary 14	Harbour Youghal Harbour Not listed.

No. Garrykenndy Tipperary 13	Garrykennedy Quay/Harbour Built by Shannon Navigation Company c. 1829. The walls of the harbour are constructed of squared limestone blocks. Water level accessed by stone steps on east side of harbour and ladders on west side. There is a low platform for loading and unloading goods on the northwest side of the harbour. Concrete and cast-iron mooring bollards. Surrounded by wall of square limestone blocks. Garrykennedy Castle (TI013:001) rebuilt on west side of harbour. Modern harbour with floating pontoons constructed to the north of the old harbour in 2005. NIAH Reg. No. 22401301; NIAH Regional Rating

No. Ballina, Killaloe Tipperary 25, Clare 45 Regional Rating	Bridge The earliest records of a bridge at Killaloe date to the 11th century. Arched road bridge over the Shannon, between Ballina in Co. Tipperary and Killaloe in Co. Clare. Comprising 12 segmental arches, showing evidence for numerous re-buildings. Triangular cutwaters, some carried up to form pedestrian refuges. Navigation arch added to centre of bridge c. 1929 to facilitate river traffic. Rubble limestone and ashlar walls and parapets with roughly dressed coping. Ashlar limestone cutwaters and voussoirs. Two commemoration plaques on bridge parapets. NIAH Reg. No. 22306005 RPS No. 210 (Clare County) TI025:09401

No. Various Tipperary 25, 31 and Clare 45	Embankment High earthen banks running south of Killaloe to Parteen Weir. Constructed c. 1925 as part of the Shannon Hydro-Electric Scheme. The banks assist in the prevention of flooding above Parteen during heavy rainfall. Not listed.

No. Birdhill, Ardclooney Tipperary 31, Clare 54	Weir The weir at Parteen was constructed across the river Shannon, immediately to the south of Kiallaloe c. 1925 as part of the Shannon Hydro-Electric Scheme. The weir wall is constructed of reinforced concrete with six sluice gates in the central section. Water is diverted into the intake of the head-race canal which conveys water to Ardnacrusha Power Station c. 12.6km to the south. Not listed.

No. Montpelier, O'Briensbridge Limerick 1, Clare 54	Bridge The earliest records for a bridge at O'Briensbridge date to the 16th century. The present bridge spans the river Shannon between O'Briensbridge in Co. Clare and Montpelier in Co. Limerick. Comprising fourteen segmental-headed arches, of various widths and heights. Evidence for numerous re-buildings, particularly as part of the construction Limerick-Killaloe Navigation in the second half of the 18th century. The western (Clare) side of the bridge has squared rubble limestone parapets with ashlar limestone voussoirs and triangular cutwaters. The soffits of the arches at this end of the bridge are covered in corrugated iron sheeting. The eastern (Limerick) side of the bridge has ashlar limestone parapet walls with a projecting string course and parapet coping. The cutwaters at this end of the bridge are round. There is a well-built limestone wharf on the western side of the river immediately downstream of the bridge. CL054:004 RPS No. H1(1) (Limerick County) RPS No. 215 (Clare County)

No. Newgarden	Mill Lisnagry Mill

North Limerick XX	RPS No. L6(30) (Limerick County)

No. Cloon and Commons Limerick XX	Railway Station Castleconnell Station RPS No. L(17) (Limerick County)

No. Lacka, Cloon and Commons, Errina, Summerhill Limerick 1, Clare 54	Weir, Eel weirs Series of V-shaped limestone-built weirs in river Shannon to the north of Castleconnell. Not listed.

No. Sreelane, Dromroe Limerick 5	Mill race and mill dam Millrace powering Plassey Mill, constructed c. 1824. For most of its length it runs through the grounds of the University of Limerick and is faced in well-dressed limestone blocks where it re-enters the River Shannon below the mill. RPS No. CT5 (Limerick County)

No. Sreelane Limerick 5	Mill (in ruins) Ruins of six-bay, six-storey Plassey Mill, constructed c. 1824 on banks of River Shannon immediately north of Plassey Bridge and opposite the entrance to the Errina section of the Shannon Navigation. It is constructed of squared limestone rubble with red brick inclusions. The west wall of the tower has been demolished and the remains of the stone spiral staircase are visible. RPS No. CT5 (Limerick County) RMP no. LI005:052

No. Dromroe, Garraun Limerick 5, Clare 63/63A	Bridge Plassey Bridge (also known as Black Bridge) was constructed at this location to replace a horse ferry in 1830. The current footbridge is mid-20th century in date and consists of cast-iron parapets supported on mass concrete piers. RPS No. CT20 (Limerick County)

No. Dromroe Limerick 5	Milestone Triangular-profile milestone, c. 1760. Inscribed on two sides - Limerick 2 miles, Killaloe 10 miles. Located on east side of River Shannon opposite southern end of Errina Canal.

No. Corbally, Athlunkard Limerick 5, Clare 63/63A	Athlunkard Bridge Five-arch road bridge completed c. 1830 under the direction of the Directors General of Inland Navigation. The parapet walls are constructed of squared limestone masonry with a projecting string course. The arches are segmental with dressed stone voussoirs and keystones. The bridge has rounded cutwaters. The piers and soffits are constructed of square limestone blocks with a projecting string course at the springing point of the arch. For a period after its construction the bridge was tolled and the toll house is still in existence on the west side of the bridge Not listed

No. Corbally	Weir Description to include listed status of monument.

Limerick 5	

No. Corbally Limerick 5	Millrace, Corbally Mill Description to include listed status of monument.

No. Corbally Limerick 5	Corbally Mill (in ruins) Description to include listed status of monument.

No. Corbally, Garraun Limerick 5, Clare 63/63a	Salmon weir (disused) Description to include listed status of monument.

No. Corbally, Monabraher Limerick 5	Shannon Bridge, Limerick Description to include listed status of monument.

No. Castle Ward, St. Patrick's Abbey Ward Limerick 5	Bridge Thomond Bridge is a seven-arch road bridge, constructed 1836-8 by Limerick Corporation. The parapet walls are constructed of squared limestone masonry with a projecting string course. The arches are segmental with dressed stone voussoirs and keystones. The bridge has rounded cutwaters. It replaced a medieval bridge of 14 spans reputed to have been erected in 1210 AD Cox 1998, 246-7; O'Keeffe & Simington 1991, 124-132 Not listed

No. Custom House Ward Limerick 5	Quay Custom House Quay was completed c. 1768 and consists of dressed limestone quay walls with steps to access the water level. Other quays in the vicinity were constructed in the late 18th and early 19th centuries. Not listed.

No. St. Nicholas', Custom House Ward Limerick 5	Bridge The main span of Sarsfield Bridge (formerly Wellesley Bridge) runs between a small river island and the west bank of the River Shannon and consists of a five-arch road bridge, designed by Alexander Nimmo. Construction began in 1824 and was completed c. 1831. Originally named Wellesley Bridge after the then Lord Lieutenant, the Marquis of Wellesley. The parapet walls are constructed of ashlar limestone masonry with a projecting stringcourse. The bridge has segmental arches and rounded cutwaters with ornamental coping. The walls of the lock are constructed of ashlar limestone masonry. Access was gained by means of a single span swivel bridge which replaced the original twin span bridge in 1923. The swivel bridge was subsequently electrified in 1926 and permanently fixed in a closed position in 1963. There is a small quay on the downstream side of the swivel bridge. The buildings on the island were constructed by Limerick's boat and rowing clubs. Ó Maidín No. 6, 6; Cox 1998, 247-9 RPS No. 034 (Limerick City)

No. Dock Ward Limerick 5	Docks Limerick Docks were constructed on the southern side of the River Shannon downstream of Sarsfield Bridge. The 'Wet' or 'Floating Dock' at Limerick was constructed between 1849 and

	1853 and was extended to the west between 1937 and 1956. It consists of a large rectangular dock c. 420m east-west by 140m north south. The walls of the dock are constructed of limestone blocks with limestone coping stones. Construction of the associated graving dock immediately to the east of the wet dock was undertaken between 1867 and 1873. The sides of the dry-dock comprise cut stone steps. When the gates were opened the dock would fill with water and the boats could be floated in. The gates were then closed and sluices opened to drain water from the dock to allow work to be undertaken on the craft's hull. A number of buildings associated with the running of the docks including the Harbourmaster's House, the Harbourmaster's Office and the Clock Tower line the perimeter of the dock. Rynne 2005, 3; Fallon 2005, 4 Not listed.

No. Dock Ward Limerick 5	Mill and Silo Bannatynes Mill, Dock Road Mill - RPS No. 283 (Limerick City), Silo – RPS No. 343 (Limerick City)

No. Dock Ward Limerick 5	Mill National Rusks, Dock Road RPS No. 289 (Limerick City)

No. Dock Ward Limerick 5	Granary Constructed c. 1787 by Philip Roche the granary consists of a four-storey grain store, constructed of squared rubble limestone. The windows are segmental-headed with red brick surrounds. The building has been sensitively adapted and is home to a number of different services. RPS No. 302 (Limerick City)

No. Dock Ward Limerick 5	Mill Watermill RMP no. LI005:019 RPS No. 302 (Limerick City)

No. Dock Ward Limerick 5	Weir RMP no. LI005:020 RPS No. 313 (Limerick City)

No. Dock Ward Limerick 5	Weir RMP no. LI005:023 RPS No. 315 (Limerick City)

River Shannon/Lough Derg west bank sites listed north to south

No. Various Galway 118	Embankment High earthen banks running between Meelick and Portumna constructed c. 1925 as part of the Shannon Hydro-Electric Scheme. The banks assist in the prevention of flooding above Lough Derg during heavy rainfall. Not listed.

No. Fairyhill	Harbour and goods store Connacht Harbour is a small harbour on the west side of River Shannon to immediate north of

Galway 127	Portumna Bridge. Accessed by a short stone-lined canal. Cast-iron bollards, early 19th century cast-iron crane and outbuildings on south side of harbour. Now used as a hire-craft marina. RPS No. 477 (Galway County)

No. Portumna Demesne Galway 127	Castle Harbour, Portumna Modern harbour located on northern bank of Lough Derg to immediate south of Portumna Castle. Not listed.

No. Rosmore Galway 132	Rosmore Pier Modern harbour located on western bank of Lough Derg. Not listed.

No. Drumaan East Clare 21A	Harbour The harbour at Williamstown was constructed by the Inland Steam Company c. 1829. The pier is constructed of square rubble limestone and crenellations have been added to its eastern end. The company also constructed a hotel immediately to the west of the harbour which closed in the 1860s when the steamers ceased to use the Shannon. The harbour is now used as a hire-craft centre. Not listed.

No. Mountshannon Clare 29	Mountshannon Quay/Harbour A small pier was constructed at Mountshannon in 1845 for the purpose of landing the rich marls dredged from the lake bottom in the settlements vicinity. Extended by Board of Works in the 1970s.

No. Lushag Rocks Clare 29	Beacon, Lushag Rocks Not listed

No. Ballyvally Clare 37	Beacon, mouth of River Shannon off Ballyvally townland Not listed

No. O'Briensbridge Clare 54	Flour mill (disused) Not listed.

Scarriff River

No. Ballyquin Clare 28	Quay Reddan's Quay on the Scarriff River is a stone built quay constructed c. 1829. A small laneway leads from the quay to Tuamgraney.

No. Drewsborough Clare 28	Quay Scarriff Dock on Scarriff River was constructed in the mid-19th century by the Shannon Commissioners following the extension upstream of the navigation. The harbour served as a distribution point for goods with goods being transported by barge down the Grand Canal from Dublin into the River Shannon, through Lough Derg and up the Scarriff river.

	RPS No. 227 (Clare County)

No. Drewsborough, Ballyminogue Clare 28	Bridge Scarriff Bridge, was constructed over the Scarriff River in the mid-19th century. Single-arch road bridge. RPS No. 220 (Clare County)

Killaloe Canal

No. Various Clare 45	Canal The Killaloe canal, runs parallel to the Shannon from a point immediately to the north of the bridge to the townland of Moys to the south of the town. The canal forms part of the Shannon Navigation and was constructed c. 1790 to bypass the falls and eel weirs at Killaloe. The canal is stone-lined and has three locks (Killaloe Lock, Moys Lock and Cussane Lock).

No. Knockyclova, Killaloe Clare 45	Pier head and dry-dock The pier head, dating to c. 1790, is located at the northern end of the Killaloe Canal and is constructed of square limestone blocks. To the immediate north of this is a dry-dock used for boat repairs. The sides of the dry-dock comprise cut limestone blocks. Not listed.

No. Knockyclova, Killaloe Limerick 5	Milestone Triangular-profile milestone, c. 1790. Inscribed on two sides - Limerick 12 miles, Killaloe 0 miles.

No. Killaloe Clare 45	Lock and lock keeper's house Killaloe lock was constructed immediately to the north of Killaloe Bridge c. 1790. Ashlar limestone walls to chamber. The lock keeper's house, which formerly stood on the piece of ground between the canal and the bridge was demolished in the early 1990s and is now the location of the Heritage Centre. Not listed.

No. Killaloe Clare 45	Bridge Single-arch bridge, built c. 1790 carrying traffic from Killaloe Bridge across the canal. The bridge has snecked limestone parapet walls with ashlar limestone voussoirs. Not listed.

No. Killaloe Clare 45	Goods shed and dock Dock located on west side of canal, constructed of snecked sandstone c. 1790. The dock has been partially de-watered following changes in water level due to the Shannon Hydro-Electric Scheme. Goods shed, built c. 1880 on spit of ground between the canal and the Shannon. Snecked sandstone with painted stone quoins and single span pitched natural slate roof. Square headed opening with timber sliding door. Segmental headed window opening to north end with stone sill and six-over-six sash window. Cast-iron crane on tracks located on canal bank to north of dock. Not listed.

No. Killaloe Clare 45	Mill Four-bay, two-storey former marble mill powered by water from the Shannon. Established c. 1832 by Charles Wye Williams. Following its closure of the marble mill it was established as a woollen mill. Currently in use as by ESB maintenance staff.

	Not listed.

No. Moys Clare 45	Lock Moy's Lock, constructed c. 1790, fell into disuse following the completion of the Shannon Hydro-Electric Scheme. Not listed.

No. Cloonfadda Clare 45	Lock Cussane Lock, double lock constructed c. 1790, fell into disuse and is now underwater due to changes in water level associated with theShannon Hydro-Electric Scheme.

Ardnacrusha Headrace and Tailrace canal:

No. Various Clare 54, Clare 53, Clare 63	Canal Ardnacrusha Headrace Canal constructed c. 1925 to convey water 12.6km from the weir and intake at Parteen to the power station at Ardnacrusha and to facilitate navigation. Large scale earthen banks, up to 18m in height line each side of the canal, constructed of material from the excavation of the canal. Spanned by three reinforced concrete suspension bridges at O'Brien's Bridge, Blackwater and Cloonlara. Not listed.

No. O'Briensbridge Clare 53	Bridge O'Briens Bridge spans the Ardnacrusha headrace canal and consists of a triple-arch reinforced concrete bridge. Constructed c. 1925 as part of the Shannon Hydro-Electric Scheme. RPS No. 193 (Clare County)

No. Cloonlara Clare 53	Bridge Cloonlara Bridge spans the Ardnacrusha headrace canal and consists of a single-arch reinforced concrete bridge constructed c. 1925 as part of the Shannon Hydro-Electric Scheme. Not listed.

No. Rosmadda West Clare 53	Bridge Blackwater Bridge spans the Ardnacrusha headrace canal and consists of a triple-arch reinforced concrete bridge. Constructed c. 1925 as part of the Shannon Hydro-Electric Scheme. Not listed.

No. Ballykeelaun Clare 53, Clare 63/63A	Power Station Ardnacrusha Power Station is located at the southern end of the head-race canal and consists of a large intake sluice building controlling water flow into the penstocks, which lead to the turbines in the generating building. Water from the turbines is discharged via draft tubes into the tail-race which leads back into the River Shannon at Parteen-a-Lux. Navigation traffic passes from the head- to the tail-race by a large navigation lock constructed next to the overflow channel. The double lock has a combined drop of 34m and boats exit into a specially designed navigation channel which re-enters the tail-race downstream of the power station. Cox 1998; Duffy 1990; Duffy 2004; Schronbenhauser 1930. Not listed.

No. Various Clare 53, Clare 63/63A, Limerick XX	Ardnacrusha railway siding Railway siding from Longpavement to Ardnacrusha power station used during the construction of the headrace canal Doyle and Hirsch 1983, 188-9 Not listed.

No. Various Clare 53, Clare 63/63A	Tailrace Built as part of the Shannon Hydro-Electric Scheme, c. 1925, Ardnacrusha tailrace is c. 2.4km in length and is cut from solid rock along much of its length. Constructed to carry water from the power station back into the River Shannon. Spanned by one single-arch reinforced concrete bridge at Parteen. Not listed.

No. Various Clare 63/63A	Bridge Parteen bridge spans the Ardnacrusha headrace canal and consists of a single-arch reinforced concrete bridge constructed c. 1925 as part of the Shannon Hydro-Electric Scheme. Not listed.

Errina Canal

No. Various Clare 54, Clare 53, Clare 63	Canal (disused) The Errina canal, runs from the Shannon at a point to the northeast of Clonlara for a distance of c. 9km before re-entering the Shannon at Plassey to the northeast of Limerick City. The canal forms part of the Shannon Navigation and was constructed c. 1770 to bypass the falls at Castleconnell and Doonass. The canal has six locks (Annabeg Lock, Gillogue Lock, Newtown Lock, Clonlara Lock, Monaskea Lock and Errina Lock) and three bridges (Gillogue Bridge, Clonlara Bridge and Errina Bridge). Not listed

No. Collisteige Clare 53	Bridge Errina Bridge is a single-arch bridge, constructed c. 1770, carrying local road over Errina canal which at this point is in a deep rock cut. Rubble limestone parapet walls with what appears to be small viewing apertures. Not listed.

No. Collisteige Clare 53	Lock The lock at Errina was originally a triple-chambered lock, constructed c. 1770, the middle chamber was removed by William Chapman to form a double-chambered lock. The walls of the lock chamber are constructed of ashlar limestone. Not listed

No. Collisteige Clare 53	Lock The lock at Monaskea was inaccessible at the time of the survey. It is a single lock, dating to c. 1770. Not listed.

No. Collisteige Clare 53	Cloonlara Lock (Errina canal) The lock at Monaskea was inaccessible at the time of the survey. It is a single lock, dating to c. 1770. Not listed.

No. Cloonlara Clare 53	Bridge Cloonlara Bridge (Errina canal) was completed in 1975 to replace the original canal bridge constructed c. 1770.

No. Newtown, Springfield Clare 53	Lock Newtown Lock (Errina canal) Not listed.

No. Springfield, Mountcatherine Clare 53	Wooden Bridge (Errina canal) Completed in 1975 to replace the original canal bridge constructed c. 1770. Not listed.

No. Gillogue, Garraun Clare 63/63A	Gillogue Bridge (Errina canal) Single-arch limestone bridge, built c. 1760 carrying a local road over the canal. The bridge has squared rubble limestone parapet walls with ashlar limestone voussoirs. The soffits are rendered rubble limestone. A narrow towpath runs under the east side of the bridge and an earthen embankment runs along the west side of the canal.

No. Gillogue, Garraun Clare 63/63A	Lock Gilloge Lock (Errina Canal) is a double lock at the southern end of the canal.

No. Garraun Clare 63/63A	Lock Annabeg Lock, constructed c. 1770, is the most southerly lock on the Errina canal. Ashlar limestone lock chamber, no longer with any lock gates. Currently this section of the Errina canal is very overgrown. Not listed.

Park Canal

No. Park, Reboge, St. Patrick's Abbey Ward Limerick 5	Canal The construction of the Park Canal was undertaken to bypass a section of the River Shannon immediately to the east of Limerick city. Construction began c. 1757 under the control of William Ockenden. The canal has two locks (Park Lock and 1st Lock) and is crossed by two road bridges and one rail bridge. Not listed.

No. Park, St. Patrick's Abbey Ward Limerick 5	Lock The 1st Lock was constructed c. 1760 and consists of a single ashlar limestone lock chamber with modern steel lock gates. Decorative carved scrolls to north wall of lock where it enters the Abbey River. Not listed.

No. Park, St. Patrick's Abbey Ward Limerick 5	1st Lock Bridge Single-arch bridge, built c. 1760 carrying a local road over the canal. The bridge red brick parapet walls and voussoirs. The abutments are constructed of random rubble limestone. The bridge has a steeply arched parapet with brick coping. Not listed.

No. Park, St. Patrick's Abbey Ward Limerick 5	Park Lock Ashlar limestone lock chamber, c. 1760, evidence of rebuilding in squared limestone blocks to west of bridge. The canal is de-watered and the lock is currently undergoing restoration. Not listed.

No. Park, St. Patrick's Abbey Ward Limerick 5	Park Bridge Single-arch limestone bridge, built c. 1760 carrying a local road over the canal. The bridge has squared rubble limestone parapet walls with ashlar limestone voussoirs and string course. Steeply arched parapet with dressed limestone coping. Underside of bridge and towpath have been built over in modern period. Not listed.

No. Various Limerick 5	Bridge Rusticated limestone abutments and piers, c. 1870, carrying rail lines over Park Canal. Replacement bridge deck. Not listed.

No. Park Limerick 5	Milestone Triangular-profile milestone, c. 1760. Inscribed on two sides - Limerick 1 miles, Killaloe 11 miles.

Abbey River:

No. King John's Island, St Patrick's Abbey Ward Limerick 5	Bridge O'Dwyer Bridge spans the Abbey River in Limerick City and consists of a reinforced concrete road bridge constructed c. 1931. Replaced a late 18th century bridge known as Park Bridge. Not listed.

No. King John's Island, St Patrick's Abbey Ward Limerick 5	Bridge Baals Bridge spans the Abbey River in Limerick City and consists of a single-arch road bridge completed c. 1831. The parapet walls are constructed of ashlar limestone masonry with a projecting string course and parapet coping. The arch is segmental with rusticated voussoirs. It replaced a medieval four-arch bridge. O'Keeffe & Simington 1991, 150-1 Not listed

No. King John's Island, St Patrick's Abbey Ward Limerick 5	Bridge Mathew Bridge spans the Abbey River in Limerick City and consists of a three-arch road bridge constructed c. 1840. The parapet walls are constructed of ashlar limestone masonry with a projecting ashlar string course. The bridge has segmental arches with ashlar voussoirs and rounded cutwaters. Not listed.