N24

Mooncoin Bypass

Road Improvement Scheme

Constraints Study Report

Final

KILKENNY COUNTY COUNCIL
Comhairle Chontae Chill Chainnigh

TRAMORE HOUSE
REGIONAL DESIGN OFFICE

September 2001

MALONE O'REGAN
Scott Wilson
..... in Ireland

N24 MOONCOIN BYPASS

CONSTRAINTS STUDY REPORT

August 2001

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Final	8 August 2001	Dairin Evers-Nolan	Kevin O'Regan	Dermot Donovan

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EXECUTIVE SUMMARY

INTRODUCTION

The purpose of a Constraints Study is to collate information on the study area and highlight constraints which may impact on the decision process when selecting a route. This report takes into consideration: -

- National Road Needs Study (NRA,1998),
- National Development Plan 2000-2006,
- Review of Transport Infrastructure Investment Needs (DKM, 1999),
- Kilkenny County Development Plan (draft 2000),
- National Roads Project Management Guidelines (NRA 2000).

The information identified during the constraints study will also be utilised and supplemented by further studies during the route selection and environmental impact assessment phases.

Preliminary Studies

To identify constraints, preliminary studies on a number of issues were undertaken. These studies included:

- infrastructure
- geology, hydrogeology and soils
- hydrology
- archaeology,
- ecology
- landscape and visual
- socio-economic / human beings
- traffic
- air quality and noise levels
- utilities
- planning and land ownership

IDENTIFICATION OF CONSTRAINTS

Geology

The majority of the study area is part of an undulating plain where the bedrock geology is Carboniferous Limestone with higher ground present in the south of the study area where the underlying bedrock is Devonian Sandstones and Mudstones and steep sided hills immediately to the south and west of the study area where the bedrock is Devonian Sandstones and Conglomerates. There are a number of faults present within the study area which trend in a NNW-SSE direction.

Alluvial areas are confined to the flat-lying flood plain areas of the River Suir. The former quarry at Granny is identified as a disused landfill site.

Hydrology

From east to west there are seven rivers either within, or adjacent to, the study area. These are the Barrow, the Black Water, the Suir, the Whelan Bridge and Dawn Rivers, the Clodiagh and the River Pill. There is localised flooding throughout the study area both along the N24 and third class roads. The Ballynamountain drainage system runs through the centre of the site. There are reed beds and wetlands south of the N24.

Archaeology

There are thirty-seven recorded archaeological sites within and in close proximity to the study area. There is one National Monument (KK043-034(01-02)). Wherever possible it is recommended that the proposed works avoid direct impact with the elements of the known archaeological landscape. Should this not be possible, a full program of archaeological mitigation should be considered at later stages.

Ecology

Seven ecological sites were identified either within, or adjacent to, the study area. Five of these were classified as very high level sites, Special Areas of Conservation (SAC's), and Natural Heritage Areas (NHA's). These are largely located around the boundaries of the study area. The remaining two sites are classified as low level constraints. The first is located along the length of the railway line and the second lies within the limestone quarry.

Landscape and Visual

All of the land lying south of the N24 extending from Granny Castle up to Fiddown and south of the N24 is designated in the Kilkenny County Development Plan, (draft 2000), as an Area of High Amenity. The individual landscape features within this area have a range of constraint values. To the north of the N24 the landscape constraints are more dispersed.

Socio- Economic / Human Beings

Most employment within the study area is agriculturally based. Farms are well-managed with good to medium quality fertile land. Waterford City and the village of Mooncoin provide a wide range of local businesses and services concerned with quarrying, agriculture,

tourism, employment, legal and banking facilities, shopping areas and social amenities, amongst others.

There are no major tourist attractions within the study area. However there are a number of potential sites of interest including thatched cottages, Granny Castle, a Motte, a Megalithic tomb, watermills, churches, holy wells, etc.

Air Quality and Noise Level Sensitive Receptors

Sensitive receptors including, amongst others, schools, churches and dwellings have been identified. These are located at Mooncoin (the only village within the study area), Pollrone, Portnascully, Ballinlough, Ballygriffin, Aglish, Filbuckstown, Portnascully, Ballybrassel, Portrone, Doornane, Grange and Ballytarsney. It is not possible to detail every sensitive receptor within the study area at this however all relevant receptors will be identified as part of the route evaluation stage.

Planning and Land Ownership

Information recorded by the County Council planning department includes details of the type of development proposed, the name of the developer and the status of the application. Planning application information in conjunction with a register of land ownership within the study area will be obtained and utilised during the route selection process.

Other Studies Undertaken

In addition infrastructure, utilities and traffic were considered however no major constraints were identified.

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1.0 INTRODUCTION

Malone O'Regan Scott Wilson was commissioned by Kilkenny County Council in association with the National Roads Authority and Tramore House Regional Design Office to undertake a Constraints Study for the proposed N24 Mooncoin Bypass.

This report follows the recommendations of the National Roads Authority (NRA) National Roads Project Management Guidelines, March 2000.

The proposed study area is located on the Kilkenny – Waterford border, north-west of Waterford city. It commences at the N9/N24 Junction, which is part of the proposed Waterford bypass, and travels along the line of the existing N24 as far as the Piltown-Fiddown Scheme, currently under construction. Figure 5.1 sets out the study area.

2.0 BACKGROUND TO THE PROJECT

Reports relevant to the constraints phase of this project include the National Road Needs Study (NRA, 1998), the National Development Plan 2000-2006, the Review of Transport Infrastructure Investment Needs (DKM, 1999) and the Kilkenny County Development Plan (draft 2000). These reports and plans set out why this proposed route is required and thus are the background to this project.

2.1 NATIONAL ROAD NEEDS STUDY

In 1998, the National Road Needs Study was published by the National Roads Authority. One of the principal objectives of this report was to ascertain *"the appropriate type of roadway for each segment of the network in order to cater for projected traffic flows over the twenty-year period 2000-2019."* The N24 from Waterford the Piltown-Fiddown Scheme is identified for improvement within the period 2000 to 2004.

2.2 NATIONAL DEVELOPMENT PLAN

The National Development Plan 2000 - 2006 for Ireland states that “Ireland has a significant infrastructural deficit which threatens to inhibit achievement of our economic and employment potential.” Ireland's income per capita is nearing the EU average. However the physical infrastructure is considerably lower than countries at or above the EU average income levels. The reduction of the capital expenditure programme during the 1980s and early 1990s has resulted in much of Ireland's physical infrastructure being inadequate for the country's existing needs and is now under strain due to the rapidly growing economy. This pressure varies but is concentrated on densely populated areas and the main national transport routes.

The National Development Plan 2000 - 2006 for Ireland outlines the development strategy for National Primary Routes. According to the Plan, the N24, as part of the Western Corridor linking Sligo, Limerick and Rosslare, is to undergo further major improvements. The programme is based on a policy to provide a high quality service on the national primary network.

2.3 REVIEW OF TRANSPORT INFRASTRUCTURE INVESTMENT NEEDS

The Review of Transport Infrastructure Investment Needs Study (published 1999) contains the reaction of the External Evaluator's team to an extensive range of recent reports and studies. This report states that Ireland's dependence on inter-urban road networks for both

passenger and freight exceed 90%, and road inadequacy, unless addressed, will inhibit continued economic expansion and frustrate regional development. It is concluded that due to the backlog of road improvement schemes and rapid traffic growth there should be a high level of investment in transport infrastructure during the years 2000 to 2006. This should concentrate on the road network outside cities and principally but not exclusively, the national route network.

2.4 KILKENNY COUNTY COUNCIL DRAFT DEVELOPMENT PLAN 2000

The 2000 Draft Development Plan for County Kilkenny states that "The development of an efficient strategic transport system in line with national policy is essential to the future economic, social and physical development of the County." According to the Plan major improvements on the N24 are required, as this National Primary road is an integral part of the western corridor from Sligo through Limerick to Rosslare.

The Council's objective is to implement the Government's strategy for the National Roads within County Kilkenny. The Policies of the Council with regard to National Primary routes include the construction of a bypass for Mooncoin (section 6.1.4 point 2).

2.5 EXISTING ROAD NETWORK

The existing N24 National Primary Road has a variable cross-section over the area of this study being narrow and without hard shoulders in some areas while other stretches have been improved in the 1970's and 80's to incorporate hard shoulders. The poorer pavement condition generally corresponds with areas which have not been widened or reconstructed in the past.

The horizontal alignment does not comply with current standards being particularly deficient in the Granny area and to the west of Mooncoin village. The road currently passes though the village resulting in safety and environmental issues. In addition to agricultural traffic, which regularly uses the existing road, it is also the principal route for heavy goods vehicles operating on the Western Corridor between Waterford and Limerick.

There are 28 at grade junctions with public roads along this section of the N24. Roadside development with private accesses along the route has also increased substantially in recent years. As traffic growth continues these public and private junctions will increasingly affect the capacity and safety of the road.

Away from the village of Mooncoin, the existing road offers some scope for re-use in a new alignment. Its reuse however will depend, along with other factors, on whether the proposed carriageway is dual or single, with reuse unlikely in the case of a dual. The amount of roadside development also strongly militates against its reuse.

3.0 THE CONSTRAINTS STUDY

The purpose of a constraints study is to collate information on the study area and highlight constraints and opportunities which may impact on the decision process when selecting a route. Data collected during this study was focused on constraints (physical, historical, environmental, etc) that exist within the study area.

The methodologies for identifying constraints for each of the issues covered by the study are set out in Sections 4.0 and 5.0.

The information identified within the constraints study will also be utilised and supplemented by further studies during the route selection and environmental impact assessment phases.

The route selection phase, which follows the constraints study will consider and identify potential routes for the road improvement scheme. Consultation with the general public, government bodies and other interested parties will be held on possible route options.

4.0 CONSTRAINTS STUDY METHODOLOGY

The data gathered during the constraints study phase of the project was collected with a view to identifying constraints within the study area. This information was gathered from a number of sources which included, inter alia, consultations with relevant agencies and statutory bodies, published and unpublished reports, documents, books, etc. The following are some of the main sources used during this constraints study. This information will be utilised when making decisions on the alignment of potential routes and during the selection of a preferred route.

4.1 AVAILABLE MAPPING

To identify constraints within the study area a number of map sources were reviewed. Initially the 6" mapping and 1:50,000 Discovery Series mapping from the Ordnance Survey (OS) were consulted to identify the major features likely to constrain the routing of the road.

4.2 AERIAL PHOTOGRAPHY

Limited aerial photography was available for this section of the N24. At the route selection phase aerial photography for the whole study area will be obtained and reviewed.

4.3 GEOLOGICAL SURVEY OF IRELAND INFORMATION

Mapping from the Geological Survey of Ireland (GSI) was correlated with aerial photography available. In particular Sheets 22 and 23 of the Geological Survey of Ireland's 1:100,000 Scale Bedrock Map Series were used to develop an improved understanding of the general ground conditions. The information obtained as part of this study is detailed further in section 5.2.

4.4 WINDSCREEN SURVEY

Where necessary windscreen surveys were undertaken to compliment the available mapping and aerial photography. Such surveys were undertaken during the landscape, ecology and socio-economic studies for this report. Observations made during these surveys were used to provide additional information on the level of development that has taken place over recent years.

4.5 PRELIMINARY STUDIES

To identify constraints preliminary studies on a number of issues were undertaken. These included:

- Infrastructure
- Geology, hydrogeology and soils
- Hydrology
- Archaeology and cultural heritage
- Ecology
- Landscape and visual
- Socio-economic / human beings
- Traffic
- Air quality and noise levels
- Utilities
- Planning and land ownership

5.0 IDENTIFICATION OF CONSTRAINTS

5.1 INFRASTRUCTURE

This section of the report describes the infrastructural constraints within the study area based on 1:50,000 OS mapping. Existing constraints include roads, railways and alignments to existing or proposed routes.

Roads

The road network within the study area is mainly composed of third class roads. The N24 is the only National route within the study area and there are no Regional roads.

Railways

The Rosslare to Limerick line is the only railway line that passes through the study area. It enters the area of interest from the east, north-east of Granny. The railway travels in a somewhat parallel manner adjacent to the existing N24 until it exits the study area close to Grange. The line is operational for both passenger and freight services. There are no plans to undertake any work outside the existing railway boundaries and no new lines are planned within the study area. No industrial railway lines have been identified from the 1:50,000 Ordnance Survey Mapping.

Alignments to Existing Routes

The Mooncoin bypass scheme will tie-in, on its western side with the Piltown-Fiddown scheme, currently under construction, and on its eastern side with the N9/N24 junction of the proposed Waterford bypass.

5.2 GEOLOGY, HYDROGEOLOGY AND SOILS

This section of the report describes the geotechnical and geological constraints that have been identified as having the potential to influence route selection for the proposed road scheme. These constraints are set out in Figures 5.2a and 5.2b.

5.2.1 Study Methodology

Identification of the constraints has been undertaken through the interpretation of geological maps, stereo aerial photographs, unpublished information on hydrogeology, published information on mineral resources and the bedrock geology of the area. Individual features were examined at scales as low as 1:10,000 but are presented on the 1:50,000 Discovery series mapping.

Bedrock Maps

The Geological Survey of Ireland (GSI) has published maps (at a scale of 1:100,000) and memoirs of the bedrock geology of East Cork – Waterford and South Wexford (Sheets 22 and 23, GSI 1995 and 1994) in which the study area is located. The sheets show the rock formations which are interpreted to be present below the surface drift deposits. An extract from these sheets is reproduced in Figure 5.2b. The lithological characteristics of the different rock types present and their general distribution within the study area have an important influence on topography and ground conditions. In a number of areas rock occurs at a shallow depth and the type of rock and its engineering properties will be important with regard to cutting, excavation and structural foundations.

Drift Maps

Superficial soils are not well mapped in Ireland and there are no published maps currently available. A new drift map for Co. Kilkenny, which provides more detail on drift types, is currently being prepared by the GSI. This, together with borehole records available on open file, provides limited information on the thickness of superficial deposits and their composition within the study area.

Manuscript copies of geological field maps at a scale of 6 inches to 1 mile have been examined. These maps were originally produced in 1839 - 1840 and were revised in 1899 - 1902. They contain notes on bedrock outcrops and the presence of drift together with some description of its type (alluvium, boulder clay).

Geological maps at a scale of 1 inch to 1 mile dating from 1857 and 1901 and the corresponding memoirs have also been reviewed. These show the distribution of alluvial deposits but do not differentiate between other drift deposits. No information on the depths of drift deposits is given. Superficial soil types are present over most of the study area and can generally be expected to provide the sub-grade material for road construction.

Black and white 1:30,000 aerial photographs (1977) were inspected at the offices of the GSI. The photographs were examined at contact scale, with areas of particular interest being magnified to a scale of 1:10,000. Colour, and black and white aerial photography flown for this scheme, the Piltown – Fiddown Bypass and Waterford Bypass projects in the early 1990's has also been examined. These photographs have provided information on the

geomorphology of the area and superficial ground conditions as well as aiding the identification of specific features.

The appearance of the ground surface and its local relief as it appears on the aerial photographs has also provided clues to the nature of the underlying geology and ground conditions within certain areas although care must be taken when linking surface features visible on aerial photographs to underlying conditions.

Hydrogeological Information

The hydrogeology of the study area is important for route selection as road construction and foundation conditions can be affected by the presence of groundwater at shallow depth. Groundwater is a natural resource which has to be protected as it provides a source of water to both commercial and residential users and may sustain particular faunal or floral habitats which require protection.

The 1:500,000 map, Major Aquifers of Ireland, published by the Geological Survey of Ireland provides a general overview of the hydrogeology of the study area. The map indicates the limestone bedrock formations present within the study area to be a major unconfined aquifer with fissure flow. The GSI report that they hold no well records for the area although a number of well sites have been identified on the historical Ordnance Survey mapping.

Economic Minerals

Information published by the GSI on mineral resources indicates that the main minerals present within the study area that could be considered to have potential economic value are limestone as an aggregate and for agricultural use, and sand and gravel deposits.

Information published by the Department of the Marine and Natural Resources has identified that a prospecting licence has been issued for the extreme northwest corner of the study area. The remainder of the study area is recorded as open areas with exploration incentives being offered, except for in the northeast.

5.2.2 Existing Environment

Topography and Bedrock Geology

Topography and bedrock geology are considered together as the bedrock geology has a major influence on the topography of the area. The majority of the study area is part of an

undulating plain where the bedrock geology is Carboniferous Limestone with higher ground present in the south of the study area where the underlying bedrock is Devonian Sandstones and Mudstones and steep sided hills immediately to the south and west of the study area where the bedrock is Devonian Sandstones and Conglomerates.

The succession of Lower Carboniferous rock present in the study area occupies the Carrick-on Suir syncline (the axis of which runs along the northern boundary of the study area), which was folded during the Variscan Orogeny towards the end of the Carboniferous period. There are a number of faults present within the study area which tend in a NNW-SSE direction. The rock formations generally dip in a northerly direction at between 10 and 30 degrees.

Late Devonian and early Carboniferous Sandstones

The oldest rocks within the study area are in the extreme southern part of the site and comprise yellow and red sandstones and green mudstones with many plant fossils of the Kiltorcan Formation (KT) of the Devonian Strunian age. These are overlain by calcareous sandstone and thin marine mudstones of the Porter's Gate Formation (PG) of early Carboniferous age.

Lower Carboniferous Limestones

Thin shale of the Ballyvergin Formation (BV) followed by the thick succession of marine limestone and mudstones rich in fossil remains which make up the Ballymartin (BT) and Ballysteen (BA) Formations. These thin-bedded argillaceous limestones give way to the thick, unbedded calcareous Waulsortian Limestones (WA), followed by the succession of clean, pale grey limestones often interbedded with thin chert beds which make up the Silverspring (SS) and Kilsheelan (KS) Formations. See figure 5.2b.

Superficial Geology

The majority of the site is covered by a layer of glacial drift. The drift comprises silty sandy clay with gravel. The composition of the gravel generally reflects the local bedrock geology and consists of limestone boulders and pebbles with variable proportions of fragments of Old Red Sandstone and Silurian rocks. There will also probably be sand and gravel deposits within the glacial drift materials. Borehole records indicate this material to be between 3 and 8m thick, although the draft drift map currently under production indicates a number of areas where the drift is much thinner than this.

The available information has not permitted a detailed differentiation between the various types of glacial drift material within the study area. However, it is considered that a more detailed knowledge of the glacial drift types would not be significant to route selection.

Recent Alluvium

Deposits of recent alluvium have generally been mapped on the historical 6-inch to 1-mile maps associated with the main river just outside the study area, the River Suir. No information is available on the thickness or composition of these deposits, although alluvium typically comprises soft clays and loose sands and silts with a variable organic content and were deposited as the river intermittently flooded the areas.

5.2.3 Constraints within the Study Area

The constraints that have been identified during the study and which are considered significant to route selection are summarised in Figure 5.2a. A brief description of constraints follows and their implication for route selection and road construction are discussed.

Shallow Rock

Shallow rock areas have been identified based on clusters of rock outcrops recorded on the historical 6 inches to 1-mile geological maps. However, it is possible that other areas of shallow rock may exist which have not been identified as they underlie a thin drift cover.

Any route through shallow rock areas may have to contend with hard rock excavation in order to achieve acceptable gradients and this aspect would represent a constraint in these areas. However, shallow rock would provide a good subgrade for the road and where the depth of rock excavation was limited this could be viewed as an opportunity rather than a constraint.

Alluvium

Alluvial areas are confined to the flat-lying flood plain areas of the River Suir. It is difficult to identify alluvium on aerial photographs, consequently these areas have been identified mainly on the basis of alluvium recorded on the historical 6 inches to 1 mile and 1 inch to 1-mile geological maps.

As alluvium can be composed of a large range of material types it is difficult to define its implications for road construction. Sand and gravel can provide quite a reasonable foundation, whilst soft clay and silt will generally provide poor founding conditions. However, alluvium within a river flood plain is generally waterlogged with water levels close to ground level and some form of elevated construction would therefore be required to raise the carriageway above the level of surface or groundwater influence.

The thickness and composition of alluvial soils is important in the design of embankments or bridges that are used to raise the carriageway level as they could potentially result in instability or high settlements requiring the use of some form of ground treatment.

As a general rule it would be wise to avoid alluvial and flood plain areas because of the potential foundation problems for embankments.

Sand and Gravel Areas

Many areas of limestone gravel are identified on the geological maps but it is not clear as to the exact nature of these materials and whether they are indicative of a weathered bedrock profile or glacial drift deposits. There will probably be sand and gravel deposits within the glacial drift materials, although they may not be large enough to be of commercial use. As such they cannot be considered as a constraint to route selection.

Disused Landfill Site

The former quarry at Granny is identified, on the draft drift map being prepared at the GSI, as a disused landfill site. There is potential for landfill gas and leachate to be generated at this site and the nature of the landfill materials may be unsuitable for road construction. This feature therefore poses a constraint to route alignment.

Deposits of Economic Mineral

The working limestone quarry near Granny which produces crushed limestone for ground agricultural limestone aggregate, concrete products and tarmacadam poses a constraint to the route alignment.

Swallow Holes

No swallow holes have been identified from viewing the available geological maps and aerial photographs although as the bedrock geology of the majority of the study area is

Carboniferous Limestone it is possible that these features may be present within the study area.

Swallow holes are karst features associated with the collapse of cavities formed in the underlying limestone due to localised concentrated solution of the limestone. The depression generated at the surface often becomes the focal point for surface drainage which then continues the solution and collapse process. The depression can grow in size and depth over time to form a small lake and peat development and the acidic conditions associated with peat can further exacerbate the process. Other solution features within the limestone which have not collapsed can also exist at shallow depth and it is possible that these may also be within influencing distance of a chosen alignment or structure foundation.

Both types of collapse features may present problems for road construction because of their potential for instability in the future. Whilst it is relatively easy to plan the route to avoid visible collapse features, it is the potential for latent instability implied by these features that poses a more serious problem.

Swallow holes or other solution features at shallow depth could potentially occur anywhere within the limestone, which covers the entire study area apart from in the extreme south. As such it is impracticable to consider them as a constraint to the route. A more detailed check on the potential for instability due to swallow holes or other solution features would need to be carried out at a later stage.

5.2.4 Conclusion

Aquifer Consideration

It is likely that public and private water supply sources are present within the study area, drawing water through springs and boreholes from the limestone although the GSI hold no records of any abstraction wells within the study area. A small number of wells have been identified on historical OS mapping of the study area but the significance of these features as a constraint is not considered to be great.

The majority of the site is underlain by limestone with a high aquifer potential. It is unlikely that road construction would have a significant impact on groundwater storage of these aquifers or the quantity of water they contain but it could result in the blockage of point or surface recharge which might result in localised surface flooding. The limestone bedrock is

classified by the GSI as a regionally important aquifer. The GSI have not yet completed groundwater vulnerability mapping of the study area. However, based on the depth to bedrock and drift material properties provided from three boreholes within the study area and applying the guidelines in the GSI Groundwater Protection Scheme Booklet it is likely that the groundwater will be given a vulnerability rating of High or Moderate.

Also of concern is the potential for pollutants from the road, either from general runoff from the carriageway or specific vehicle spillages, being introduced into the aquifer. Because of the mixed nature and variable thickness of the glacial drift over the area, the rate at which surface water penetrates the aquifer is likely to be very variable. In the shallow rock areas the more permeable limestones will be particularly vulnerable to surface pollution. Whilst this is unlikely to be a specific constraint to route selection, measures should be included in the design to safeguard the aquifer against pollution generated by the road.

5.3 HYDROLOGY

5.3.1 Study Methodology

Drainage Systems

This section sets out the main hydrological constraints within the study area. Information was gathered from 1:50,000 Discovery mapping and consultation with the Office of Public Works (OPW), EPA and Kilkenny County Council.

5.3.2 Existing Environment

There are no major rivers within the study area. The surrounding landscape is dominated by seven rivers. From east to west these are the River Barrow (approximately 9 km from the study area), the River Blackwater (adjacent to the study area boundary), the River Suir (east, south and west of the study area), the Whelan Bridge River and the River Dawn (both south of the study area), the River Clodiagh (southwest of the study area) and the River Pill (west of the study area).

The Ballynamountain drainage system, which runs through the centre of the site flows in a westerly direction towards Piltown into the River Pill. After passing through the system of reed beds and wetlands south of the N24 the rivers of the drainage system and the River Pill flow into, or join, the River Suir eventually. A number of the tributaries that connect into these rivers, flow through the study area.

5.3.3 Constraints within the Study Area

After examining the study area and surrounding landscape, it appears that the drainage system north of the N24 is composed of a vast number of small streams that meander in a north-southerly direction. The important hydrological or drainage system that occurs south of the N24 relates to the reed beds and wetlands that are located south of Mooncoin. Such reed beds and wetlands help to filter run-off prior to its discharge into the River Suir. Within the study area the N24 traverses three tributaries of the above rivers. The first crossing is approximately 0.5 Km into the study area from the east. The second crossing is at Ballynamountain Bridge and the third approximately 0.5 Km before Clonmore Crossroads.

There are also a number of lakes / large ponds within 10 km of the study area. These include, from east to west, Lough Cullin, King John's Bridge pond and the Curraghmore reservoirs. The Knockaderry reservoir and the two Ballyshonock reservoirs, also within 10 km, supply public water to east Waterford and service parts of the Waterford City, Tramore and Dunmore East water supplies. Approximately 5 million gallons of water are abstracted from these reservoirs each day. For the most part these water bodies are supplied by one or more of the many tributaries within the general area.

Flooding

There is localised flooding throughout the study area both along the N24 and third class roads. Following are the approximate National grid references for the locations of these sites from east to west along the N24. This study area is located within the 'S' 100,000 m National grid square. The first three numbers refer to eastings (vertical grid line) to the left of the point, while the second three numbers refer to the northings (horizontal grind line) below the point.

- On N24, immediately east of Mooncoin village (S 502 164)
- South of N24, on third class road travelling from Mooncoin, adjacent to school and church (S 504 161)
- North of N24, on third class road between Kilcraggan and Grange Station (S 509 176)
- North of N24 at intersection of railway line and third class road south of Ballincurra S 525 167)
- South of N24, on third class road, north of Portascully (S 519 141)
- On N24, just before junction with third class roads prior to entering Mooncoin (S 530 153)

- South of N24, on third class road between Ballynamountain and Ballinlough (S 532 144)
- Intersection of N24 and third class road travelling to Dungooly (S 536 151)
- North of N24, on third class road, at Dungooly (S 542 156)
- North of N24, on third class road travelling from Kilmacow lower adjacent to megalithic tomb (S 546 168)
- South of N24, on third class road, east of Curraghmartin (S 548 146)
- South of N24 at Curraghmartin (S 554 146)
- South of N24, on border of study area, at Portnahully ((S 558 137)
- On N24 at Ballygriffin (S 565 146)
- Intersection railway line and first third class road leading off N24 in northward direction (S 577 157)

In addition to localised flooding some tidal flooding also occurs. The range of this flooding can travel as far inland as Dungooly but is usually restricted to an area between Portascully, Ballynamountain, Dungooly and Aglish.

5.4. ARCHAEOLOGY

This section of the report provides information on the known archaeological data within the study area under consideration. It also provides information on sites of architectural significance within the study area. The report discusses the receiving environment from an archaeological perspective in very general terms, it describes the known baseline data in some detail and it recommends that the proposed works avoid direct impacts with known archaeological and architectural sites. At constraints phase only a desk study has been undertaken.

5.4.1 Study Methodology

This assessment consists of a desk study identifying all recorded sites within and in close proximity to the area of study. This is a document search utilising a number of sources including the Sites and Monuments Record (SMR), National Museum of Ireland Topographical Files, the County Development Plan and literary sources.

The Sites and Monuments Record

The Sites and Monuments Record is an inventory of archaeological sites known to the National Monuments Service with accompanying Record of Historical Monuments and

Places (RMP) Constraint Maps, based on OS 6" Sheets, which indicate the location of each recorded site. The inventory is backed up with files housed in the National Monuments Services offices, which provide information on documentary, cartographic and photographic sources, and field inspections that have taken place in relation to each identified site. The record is updated on a constant basis. *Dúchas* has focussed on monuments that predate 1600AD. Buildings belonging to the seventeenth century and later are not well represented in their archive, although they are considered as archaeological sites today. As a result field inspection may reveal additional sites from this recent past. As yet there is no published inventory for County Kilkenny.

The National Museum of Ireland Topographical Files

The National Museum of Ireland Topographical Files is the national archive of all known antiquities by the National Museum. These files are housed in the National Museum of Ireland. These files relate primarily to artefacts but also include references to monuments and have a unique archive of records of previous excavations. The find-spots of artefacts can also be an important indication of the archaeological potential of the related or surrounding area. The Museum's files present an accurate catalogue of objects reported to that institution between 1928 and *c*. 1995. Records of material acquired by the Museum before and after these dates are not readily accessible, unless they have been mentioned in publications.

Kilkenny County Development Plan (draft 2000)

The Kilkenny County Development Plan (draft 2000) was also consulted. This plan sets the Council's policy for the conservation and enhancement of the county's natural and built environment and lists items of special environmental or archaeological/artistic interest. It contains lists of historic buildings and other items for preservation as compiled for the County Council by expert bodies. They also include a completed list of industrial archaeological items.

Literary Sources

Finally, a number of literary sources were consulted. Literary sources are a valuable means of completing the written archaeological record of an area and gaining insight into the history of the environs of the proposed works. The principle sources consulted include: Rev. W. Carrigan, *The History and Antiquities of the Dioceses of Ossory*, 4 Vols (1905*);* O. O'Kelly, *The Place Names of County Kilkenny* (1969); Mark Bence-Jones, *Burke's Guide to Country*

Houses Volume I, Ireland (1978); Peter Harbison, *Guide to the National Monuments of Ireland* (1975).

5.4.2 Existing Environment

Overview

This is a rich archaeological landscape with a total of 37 recorded archaeological sites being identified within and in close proximity to the study area. It is important to note that several of these sites have been identified through aerial photography, where the above ground indications of the monument have been destroyed. These have been interpreted as cropmarks, an enclosure and two *fulachta fiadh*. The strong tradition of past agricultural practices has been largely responsible for the destruction of this type of site. Given the quantity of sub-surface sites, it is very likely that further sites with no visible surface remains, that previous ploughing activity has helped to remove, are also located within the study area.

A single, now totally destroyed, megalithic structure is recorded as having been located within the study area. These tombs have a broad date range from the Neolithic to the Early Bronze Age (c. 4000 – 1500 BC) with wedge tombs assigned to the final phase of megalithic building. The former presence of this type of site in the area is an indication of well-established activity and settlement during either the Neolithic or Early Bronze Age.

The vast majority of the sites identified in the desk study consist of *fulachta fiadh* (14 in total). Most of these sites were identified during a National Museum of Ireland *Fulacht Fiadh* Survey and presumably remain extant. *Fulachta fiadh* generally comprise of three main components, a horse-shoe shaped mound of burnt and firecracked stones, a trough sometimes lined with a material such as wood or stone, and a hearth. *Fulachta fiadh* are usually found in association with a water source, but not fast flowing rivers or large lakes. Many of these water sources may now be no more than dried stream-beds. The small number of this site type, which has been dated in Ireland, suggests that they belong to the Bronze Age (Brindley, Lanting and Mook, 1989-90). Descriptions of a cooking method using these components occur in many medieval texts. Some dates, from sites with similar components, from the Neolithic and Medieval periods indicate this methodology had a long history of use in Ireland.

Both enclosure sites listed in the Record of Monuments and Places were identified through aerial photography, where they appear as cropmarks. The majority of these sites have been

levelled through time and as a result it is often difficult to determine their exact nature. The term enclosure is generally used to describe enclosed areas, rectilinear or circular. This site type is identified through field survey, cartographic sources and aerial photography. The circular enclosures, which are no longer extant, may actually be destroyed ringforts. This type of site has not been closely dated and may have been in use in various different periods.

One definitively classified ringfort was identified in the study area. These monuments are the most widely distributed and commonplace monuments on the Irish landscape. A typical ringfort consists of a circular, oval, D-shaped or sub circular area, usually 20-50m in diameter, and enclosed by one or more banks of earth, a combination of earth and stones or a dry-stone wall. These monuments are believed to have served as enclosed homesteads, protecting houses, their inhabitants and livestock. Some of the more elaborate ringforts may have served as venues for social gatherings. Research and excavation have dated the majority of ringforts to between *c*. 500-*c*. 1200AD (Mitchell & Ryan 1997, 254-261; Edwards 1990, 6-33).

A single souterrain was identified within the study area. These are underground, manmade structures ranging in length from 5m to over 100m. These were either tunneled through clay or rock or are of timber or drystone construction in a subsequently backfilled trench. Each souterrain normally contains several elements: a single entrance/exit, one or several low passages, one or more circular or rectangular chambers and obstructions in the form of creeps or sudden changes in level. These sites are frequently associated with ringforts and early ecclesiastical settlements. This, and references to this site type in manuscript sources, suggests they were built as refuges for people and goods in times of danger. Excavation results indicate a date range from c. AD 800 to 1200.

A number of castles, tower houses and mottes were identified in the study area. The Anglo-Normans were responsible for the introduction of stone castle building into Ireland some time after AD 1169. On the basis of date and architecture, Irish castles can be divided into three main types: early castles, royal or seigneurial castles of the late 12th and 13th centuries; fortified tower houses, defended residences of the rural gentry dating from the 15th to 17th centuries; and towered and gabled houses, a transitionary type dating to 17th century when changeover from castle to mansion was almost complete. As tower houses are later in date, these usually remain extant. They are generally rectangular in plan, several storeys in height

and contain a number of defensive features including wall-walks at roof level and murder holes. Tower houses tended to be incorporated in bawns and surrounded by high walls.

A typical motte and bailey consists of earthen mounds, which were usually erected as initial forts by the invading Anglo-Normans in the 12th century. The summit may have been surrounded by a wooden palisade and surmounted by a wooden watchtower while a fosse encircled the base. The bailey is an enclosure or platform, usually rectangular or crescent shaped, separated from the motte by the fosse. Very few of this site type have been excavated in Ireland and knowledge of them comes from contemporary documentary evidence. In the early days of the invasions, these mounds would have been equipped with wooden defences and fortifications, which may later have been replaced with stone fortifications. These mottes were usually located at strategically important positions and usually command excellent views of the surrounding countryside.

Quite a number of ecclesiastical remains were also found within the study area (9 in total). These consisted primarily of churches and graveyards, with features such as bullaun stones, fonts and altar tombs. In one case a surrounding earthen bank survives while documentary evidence suggests a second was similarly surrounded at one point. The presence of the earthen enclosure may indicate an Early Christian or Medieval date for the religious foundation. Many of these early sites were replaced with later structures and as a result they can be difficult to date. One site within the study area is known to have been built on the site of an earlier medieval building and the presence of many nave and chancel churches also suggests a similar medieval date for many other sites. Nave and chancel churches date primarily to the 12th and 13th centuries while more simple rectangular buildings are of 14th to 16th century date. The later buildings are identified through the practice of placing the doorway in a sidewall, usually the south, and often contain evidence of a loft or an extension – possibly living quarters for clergy members. The earlier nave and chancel churches may have served monastic communities the later buildings were built and used as parish churches form the 12th century onwards. A number of post-medieval (1540 onwards), churches are also included.

Many of the holy wells within the study area are associated with ecclesiastical remains but a number of isolated sites occur. This site type may consist of any water source which is used as a focal point for devotion, divination or cure. Holy wells can range from small natural springs or small hollows in bedrock to mortared stone well chambers with steps, canopies or

wall niches. Most holy wells are associated with a particular person, mainly saints. Often found with holy wells are leachts (small flat-topped stone altars), small cairns, bullaun stones, cross slabs and architectural fragments of ecclesiastical nature. The date of the origin of the dedication of some wells is known from documentary evidence and many are still used for pilgrimage to this day. Consequently local interest in and awareness of such sites can often be very high.

Some 17th century and possible earlier dwellings within the study area are associated with the castle and tower houses. These may be early examples of architect-designed houses in County Kilkenny. It is possible that some of these are still inhabited while others may have been destroyed. Associated landscape features might include formal gardens, vistas, ponds, mazes, and tree rings (normally a characteristic of demesnes). Some tree rings have been discovered to be modified barrows, ringforts and mounds, which had been converted to garden/demesne follies in the 18th & 19th centuries.

National Monuments

One of the sites identified in this report is classed as a National Monument and is currently under state care (Castle & Dwelling, KK043-034 (01-02)). The term 'National Monument' as defined by the 1930 National Monuments Act, "a monument or the remains of a monument the preservation of which is a matter of national importance by reason of the historical, architectural, traditional, artistic, or archaeological interest attaching thereto" (The National Monuments Act, 1930, Part 1, Preliminary and General, Section 2). This definition does not restrict inclusion based on dating and includes land adjacent to a national monument, which is required to preserve the amenities of the monument.

The majority are listed in the Record of Historic Monuments and Places (RMP), established under Section 12 of the 1994 National Monuments (Amendment) Act. Under the terms of this act, the Minister is required to establish and maintain a record of the monuments and places where the Minister believes there are monuments. This record gives protection to the monuments without having to establish that a monument is in danger of falling into decay. The term 'monument' as used in this Act encompasses all artificial structures, regardless of date, whether or not they are of archaeological or architectural interest, but excludes buildings used for ecclesiastical purposes. All monuments, whether or not, in State ownership or care, or be designated or subject to any legal protection, could potentially be classed as 'National Monuments'. A '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'. Any monument dating prior to AD 1700 is automatically a historic monument, but monuments post-dating AD 1700 may also be included.

The inclusion of archaeological objectives by planning authorities in their statutory development provides the basis for such authorities to provide for the protection of the archaeological heritage. These objectives, which may be set out in a County Development Plan, include the 'preservation of caves, sites, features and other objects of archaeological, geological or historical interest'. These may also include the 'preservation of buildings of artistic, architectural or historical interest'.

Preservation Orders, Registered Sites and Sites listed in County Development Plans

No archaeological sites within the study area are listed as being protected by Preservation Order or as Registered Sites. One site is listed in the County Development Plan as being protected by a Listing Order/Regulation (Motte & Bailey, KK042-017). In certain circumstances County Councils list and highlight certain archaeological sites in their respective areas for protection from development under the provisions of the National Monuments (Amended) Acts.

Record of Historic Monuments and Places

The remaining 35 of the archaeological sites identified in this report are listed in the Record of Historic Monuments and Places (RMP), which was established under Section 12 of the 1994 National Monuments (Amendment) Act. Under the terms of this act, the Minister is required to establish and maintain a record of the monuments and places where the Minister believes there are monuments. This record gives protection to the monuments without having to establish that a monument is in danger of falling into decay.

Seven of the RMP sites are also listed in the County Development Plan as Archaeological Sites and Structures, which shall be preserved and protected by the County Council.

Rivers

The importance of rivers in archaeology was given added recognition in 1998 with the issuing of a memorandum from *Dúchas* The Heritage Service that requires archaeological assessments to take these water bodies and associated features into consideration. This

was due to the fact "that linear developments particularly roads often cross rivers and impact on mills, fords, old bridges and findspots of archaeological material. Other sites such as castles and longphort (Viking) settlements are also found beside rivers" (Memo from *Dúchas* re. River Crossings and Bridges, 23/04/98).

Bogland

There is no large area of bogland within the study area. However smaller areas of bog or highly organic waterlogged soils should be noted in the more detailed phases of study for this proposed road scheme. Bogs or water-logged areas are frequently rich sources of archaeology and their exceptional capability in the preservation of remains makes them a unique archaeological resource.

5.4.3 Constraints within the Study Area

Catalogue of Archaeological Sites

A full Catalogue of Archaeological sites is contained in Appendix 1. The catalogue deals with the study area surrounding the existing N24. The entries listed follow a consecutive numeration based on each site RMP No. All the sites listed lie within the study area, with the exception of a few which lie in direct proximity to the perimeter.

Each entry provides locational information and a brief description. The abbreviation RMP refers to the national archaeological survey's registration of the site, namely its Record of Monuments and Places number.

Architectural Heritage

The buildings and structures listed in Appendix 2 were identified in expert surveys carried out for Kilkenny County Council. It is the policy of each of the Council to seek the preservation of these structures wherever feasible. No building or structure listed in the plans may be demolished or materially altered without grant of Permission under the Local Government Acts.

Additionally it is the intention of Kilkenny County Council to prepare an architectural conservation area plan for the village of Portnahully, located at the extreme south of the study area. This will be carried out in accordance with a new mechanism provided in The Local Government (Planning and Development) Act 1999, the Architectural Conservation Area (ACA). The ACA mechanism is used to protect groups of structures and the setting of

protected structures. This village has been designated in the Kilkenny County Development Plan (1999) and has been recognised as having outstanding examples of vernacular architecture in small, intact settlement/community structures.

Recommendations

Avoidance

It is firstly recommended that if possible all impact on sites as included should be avoided in the selection of the preferred route option.

River Assessment

In planning the Mooncoin Bypass the archaeological merit of the waterways within the study area needs to be taken into consideration. It is likely that levels of pre-disturbance archaeological assessment of relevant sections will be required ahead of the construction phase once the Preferred Route Bridging Plans are available.

Bogland

The archaeological merit of any bogland affected by the proposed development needs to be taken into consideration. It is recommended that these areas be avoided if possible.

5.4.4 Conclusion

Research through desk study indicated that the N24, the Mooncoin Bypass, passes through a landscape rich in archaeology. There are thirty-seven known archaeological sites and areas of archaeological potential within the Study area. Two of architectural significance were also noted. The study area also contains a number of small waterways.

This report recommends that the proposed works avoid direct impact with the elements of the known archaeological landscape. Should this not be possible, a full program of archaeological mitigation should be considered at later stages.

5.5 ECOLOGY

This section of the report identifies the main ecological constraints within the study area. Data collected will be used to assist in the development of route options and form the preliminary stage of a full ecological assessment.

Predominantly rural in character, the landscape comprises a mosaic of small arable and pastural fields. These are separated by a network of hedgerows with standards, walls, and one small area of young plantation woodland. The River Suir is designated as a Special Area of Conservation (SAC) under the EU Habitats Directive (92/43/EEC). It is notified for a range of habitats and species including alluvial forest, old oak woodland, freshwater pearl mussel and freshwater crayfish. Further details of the designation are provided in Table 5.5 and Appendix 2. Several Natural Heritage Areas (NHA's) also lie within the study area, including Fiddown Island and Tibberaghny Marshes.

A number of semi-natural habitats lie outside the designated areas. The railway line that runs east west through the northern sector of the study area forms a corridor of semi-natural habitat in what is otherwise a relatively intensively farmed area. A working limestone quarry, which occupies a large area to the eastern end of the study area, supports a number of small patches of semi-natural habitat including scattered scrub and unimproved grassland.

5.5.1 Study Methodology

The methodology for the study is based upon the Stage 1 Assessment described in the Design Manual for Roads and Bridges. The study consists of three elements:

- The location of designated sites and internationally protected species within the study area, and the collection of information available on such sites.
- The assessment and analysis of aerial photographs to identify those areas of ecological value which do not lie within a designation. However, as aerial photograph coverage was extremely limited in this case a windscreen survey was undertaken to classify areas into broad habitat types and obtain an impression of land use;
- The review of those sites identified and their separation into categories.

Consultation and Data Collection

The following organisations were consulted in order to gather baseline information on the study area:

- Duchas: Natural Heritage,
- Irish Wildlife Trust,
- Southern Fisheries Board,
- Kilkenny County Council.

These organisations provided information on the designation of sites and descriptions of their nature conservation interest. Protected species data was also recorded where available, however limitations in species distribution records prevented a fully comprehensive assessment being undertaken.

Evaluation of habitats

Sites were assessed using a multi-criteria methodology. The criteria chosen relate to the habitats within the study area. For the purposes of this report the four criteria chosen were size, fragility, re-creatability and rarity. For the purposes of this report the value of sites is determined relative to other sites within the study area. These classifications and assessments are based on information gathered through a desk study and a broad-stroke walkover survey. The actual value of these sites cannot be confirmed until the route selection phase of the study at which time a more detailed walkover survey will be undertaken. A breakdown of the numerical scores associated with each criterion are presented in Appendix 2.

Size

It is commonly accepted that larger areas of habitat generally support a greater diversity of species and can maintain larger populations of species due to being able to buffer environmental changes more readily.

When considering this criterion a positive correlation between size and nature conservation importance has therefore been assumed, i.e. the larger the habitat the greater its importance for nature conservation. In the absence of published research, threshold values for each habitat are based upon practical ecological experience, management constraints of the habitat and professional judgement.

Re-creatability

Although it is generally impossible to recreate identical communities, the potential for habitats to be replaced or recreated to a habitat of similar or better quality often exists. Such potential varies between different habitat types - the more natural an ecosystem, the greater the difficulty in recreating it to its original richness and complexity (NCC, 1989). In addition to the ecological feasibility of such measures, the timescale over which habitats can be recreated is of importance, re-creation being less acceptable if it will take several decades to become a comparable habitat.

The lower the re-creatability of a habitat, the increased importance it has for conservation purposes. Threshold values for each habitat are based upon the ease of re-creatability, assuming a time period of 25 years (an approximate human generation). In addition, it was considered that, the loss of natural and semi-natural habitats was very important and this was taken into account during the review and classification of the habitats.

Rarity

A rare habitat, or the presence of a rare species within a habitat at a local or national level has an important effect on the ecological value of that site. The presence of internationally rare habitat or species increases the importance of that site for nature conservation purposes.

Fragility

Fragility, or sensitivity, is strictly an indication of a habitat's susceptibility to change (in this case through potential effects of the proposal). The higher the fragility of a habitat, the increased importance to ensure it is protected from potential negative effects of the proposed development. Threshold values for each habitat, which dictate the score allocated, are based upon the level of fragility of each habitat, based upon practical ecological experience and professional judgement.

5.5.2 Existing Environment

A total of 7 sites were identified either within, or adjacent to, the study area. Five of these were identified as either NHAs or SACs and were therefore classified as very high level constraint sites. The two remaining sites were classified as low level constraint sites due to there lack of designation and their value at a local level. Figure 5.5 shows the location of each of the sites.

5.5.3 Constraints within the Study Area

Very High Level constraints

Very high-level constraints include sites designated as Special Areas of Conservation (SAC's) are designated under the EC Habitats Directive (92/43/EEC), and nationally designated Natural Heritage Areas (NHA's). These sites support habitats and species listed under Annex I and II of the EC Habitats Directive. NHA's have recently been afforded statutory protection under the Irish Wildlife (Amendment) Act 2000. Further details of the

designated sites, including habitat descriptions and notable species of flora and fauna are provided in Appendix I.

The presence of SAC / NHA sites substantially limits the powers of planning authorities to grant permission for developments which have been assessed as adversely affecting their integrity (i.e. whether the project would adversely affect 'the coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and/or populations of species for which the site is classified').

Table 5.5a: Designated sites and rivers known to support protected species.

Site Name	Status	Reason for designation
Lower River Suir	SAC	Habitats and species identified under Annex 1 and 2 of the Habitats Directive.
Granny ferry	NHA	No information available
Fiddown Island	NHA	Vegetated river island
Tibberaghny marshes	NHA	Marshland important for wintering waterfowl
River Suir below Carrick-on-Suir	NHA	Marshland important for wintering waterfowl

Low Level Constraints

Scores for the two areas which lie within this category are provided in Appendix 1. The first is the railway corridor that runs the entire length of the study area to the north of the existing N24. Unimproved / semi-improved grassland and a band of mature trees abut the railway. Grassland within railway corridors is often floristically diverse due to the lack of intensive management with cutting or mowing regimes and fertilisation. These habitats associated with the railway also provide important habitat for wildlife in what is otherwise an intensively farmed area.

The second area of low value is comprised of fragments of semi-natural habitat. These have been retained within the limestone quarry which occupies a large area in the east of the site, north of the existing N24. Semi-natural habitats within the quarry include broad-leaved woodland, unimproved / semi-improved grassland and scattered scrub.

5.5.4 Conclusions

The distribution of SAC/NHA sites (high value sites) and semi-natural habitats (low value sites) is illustrated in Figure 5.5. The SAC/NHA sites are largely located around the

boundaries of the study area, mainly being habitats associated with the River Suir. The landscape within the study area is generally intensively farmed and of low ecological value.

Both of the areas of semi-natural habitat that have been identified lie to the north of the existing N24. Although not designated for their ecological value, these habitats are also associated with features within the landscape that form physical constraints to development, i.e. a quarry and railway corridor. They have developed some intrinsic ecological value through lack of management, which has allowed the re-generation of transitional or 'ephemeral' habitats.

5.6 LANDSCAPE AND VISUAL

This section of the report describes the landscape characteristics and visual aspects of the study area in terms of topography, land use and amenities.

5.6.1 Study Methodology

The study was undertaken on the basis both of a desk study and a brief windscreen survey, which was limited to travelling the major parts of the existing major and minor road network with occasional overview inspections from key viewpoints.

The desk study was based on the following:

- O.S. 1:50,000 mapping
- Kilkenny County Development Plan (Draft 2000)
- Partial aerial photography
- Communication with some authorities - Teagasc
- References/research

5.6.2 Existing Environment

The study area consists of an oval shaped expanse of land of a gently undulating lowland topography, similar to a long low mound rising from river level in the east/south-east at Granny Castle to a maximum height of some 39m east of Mooncoin, and falling again towards river level to the north-west close to Fiddown.

The area is close to or adjoining the River Suir valley and is set between the forested hills around Portlaw to the south-west (Tower Hill, Donald's Hill, Lahardan Hill) and the equally

forested hills to the north/north-east (Tory Hill, Carrigtubrid Wood, Corbally Wood, Mullinbeg, Carriganog Hill, Kilmacoliver Hill, Carrigadoon Hill.

Prominent in the distance to the west lie the Comeragh Mountains, and to the northwest Slievenamon. More immediately to the direct south of the study area there is a local small hill or high point in the vicinity of Licketstown. There are no distinct hills as such within the study area. Minor ridgelines lie to the north and south of the existing N24.
The study area is primarily in agricultural use for pastoral grazing, silage production and some tillage. Other land uses include fruit production, quarrying and industrial development.

The River Suir with its wetlands and reed beds to the south contrast dramatically with the surrounding agricultural land.

Established settlement development is generally clustered at crossroads, along both the N24 and at the various minor road junctions, particularly to the south. Significant ribbon development in recent years has tended to link many of these established settlements

Overhead cables and power lines running in an east-west direction through the study area are a source of visual intrusion in this valley landscape.

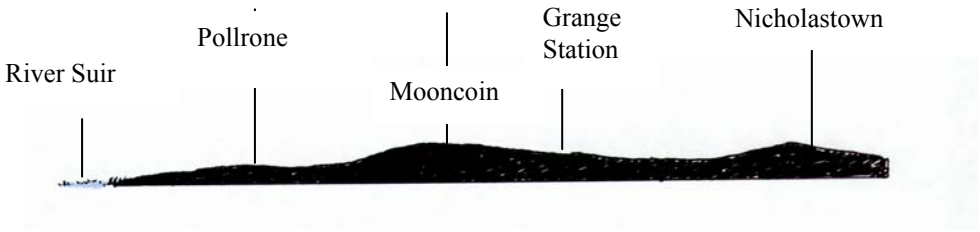
Topography and Landform

The study area is divided in an east-west direction into two parts by the N24. The area to the north of the N24 is characterised by a gentle undulation and almost insignificant ridges which rise to a maximum of some 43m above sea-level, falling away slightly to the north and to a more significant degree to the east and west. The N24 generally lies between 20m OD and 30mOD.

Looking northwards from the N24 towards the distant hills, the topography rises and falls significantly from lows of 10m to highs in the region of 40-45m before rising further into the nearby hills in the vicinity of the South-Leinster Way.

South of the N24 looking towards the River Suir, the hills and valleys tend to be steeper. In the vicinity of Granny Castle, the land slopes steeply down to the River Suir. The western portion of this southern area, in the vicinity of Pollrone Quay, the land close to the River Suir

is low-lying and subject to flooding, with more pronounced undulation occurring close to the N24. The cross-section as shown below illustrates the topography of the study area.



North-South Cross-Section through Mooncoin - Scale: Horizontal 1:50,000, Vertical 1:5,000

Drainage Systems

To the north of the N24 the drainage system meanders and flows over the gentle rolling landscape producing a distinctive dendritic pattern. The majority of the drainage systems within the study area flow in a north-south direction across the site feeding into the main regime, the River Suir, which flows in a generally easterly direction, but in a meandering fashion.

South of the N24 the drainage pattern changes in that the length of the individual streams tends to be shorter and they tend not to meander but flow in distinctive straight southwesterly lines into the River Suir. For further data on the Drainage system within the study area see section 5.3.

Land Uses

The principal land use in the study area involves agricultural activities including grazing land and/or land managed for silage harvesting. Field patterns and hedgerow systems as seen from aerial photographs confirm this. The following land uses occur within the study area and are significantly important in a local context:

Quarrying

Extensive commercial quarrying is taking place within the study area in the vicinity of Flemingstown.

Intensive Fruit Farming

Commercial fruit growing is practised on an extensive scale in the vicinity of Clonmore at the western end of the study area.

Industrial Activities

Industrial/service activities at Ballygriffin

Port Related Activities

Jetty on River Suir at Ballygriffin

Transport Infrastructure

Rosslare – Limerick Junction rail line

Tourism and Recreational Activities

Walking: the Mooncoin Way; fishing: the River Suir; shooting: the bank of the River Suir and general agricultural land.

In general, agricultural farming and quarrying land uses together with the rail line, occur to the north of the N24 whilst agricultural farming, tourism/recreational activities, fruit farming and port related activities occur to the south of the N24.

A minor but relatively unique land use in the study area relates to the harvesting of reeds for thatching purposes from the reed beds along the banks of the River Suir. Many traditional style cottages can be found in the area south of the N24 with roofs thatched using locally harvested reeds.

Woodland and Trees

There are only a few isolated areas of mixed or deciduous woodland at Waddingstown and in the vicinity of Rathcurby. Otherwise the land within the study area has been cleared in the distant past of its natural woodland for agricultural use and current commercial afforestation has not been adopted in the area of study.

There are no tree preservation orders placed within the study area. However there is an extensive and well-maintained network of hedgerows within the study area, some of which contain quite mature trees, and all of which act as a valuable natural and landscape resource in the area.

There are some fine specimen mature trees in the vicinity of Mooncoin village, and also in association with estate type landscape at the north-west end of the study area in the vicinity of Clonmore.

Archaeological/Historical Structures/Landscape Setting

The study area contains a range of archaeological/historical structures, which influence the local landscape character to a significant degree. Those south of the N24 include:

- Holy well, church and graveyard south of Clonmore Crossroads,
- Church and graveyard near Pollrone Pier,
- Motte and bailey, church, graveyard and holy well, together with watermill, millponds and millrace all near Portnascully,
- Church and graveyard by N24 near Waddingstown,
- Granny Castle at the eastern end of the study area.

While north of the N24 there are:

- Castle located on the edge of the study area at Grange,
- Megalithic tomb west of Ballynearla.

The landscape setting of archaeological or historical structures is a significant element of the landscape value of such features, and this has been recognised in the Planning & Development Act 2000, No. 30 of 2000, which now incorporates the concept of "attendant grounds" in relation to a structure, as including land lying outside the curtilage of the structure. The curtilage of a structure is limited to the area attached to a building and forming one enclosure with it.

Landscape Character Areas

The study area as such only exhibits three landscape character types, namely undulating farmed lowland, historic undulating farmed lowland and river valley landscape.

It is due to the unique historic settlement features that the undulating farmed lowland is divided into two separate character areas.

Undulating Farmed Lowland

This primarily relates to the section of the study area to the north of the N24 and features a grassland field mosaic of gently undulating lowland. The area also features:

- some diversity in land-use patterns due to extensive quarrying for stone.
- an intense pattern of narrow roadways.
- a railway line with associated bridges and station.

Historic Undulating Farmed Lowland

This relates primarily to the section of the study area lying to the south of the N24, but also includes a portion of the study area to the north of the N24 in the vicinity of Mooncoin as far as Ballytarsney, and extending to the north-west towards Grange.

The landscape character of this area features a grassland field mosaic on gently undulating lowland, largely featuring agricultural land use, but also featuring

- some diversity in land-use patterns including intensive fruit production, industry and tourism/recreational activities.
- an intense pattern of narrow roadways and a dense settlement pattern, more particularly to the south.

The historic landscape characterisation of this section of the study area, marking it as a unique historic or cultural landscape, is due to both the settlement pattern and the local concentration of vernacular thatched cottages.

The established settlement pattern featuring “farm villages”, mainly clustered around road junctions, is one of only three such examples in Ireland which can be traced back to pre-seventeenth century feudal villages.

River Valley Landscape

This landscape character type exists at the extreme eastern and western ends of the study area along the banks of the River Suir, featuring:

- river/port related activities,
- reedbeds and mudflats,
- poorly drained wetlands adjoining the river.

5.6.3 Constraints within the Study Area

For the purposes of this report, designated landscapes refer to those identified in the Draft Kilkenny County Development Plan, 2000.

Area of High Amenity

All of the land lying south of the N24 extending from Granny Castle up to Fiddown and embracing the section of the study area south of the N24 is designated in the Draft County Kilkenny Development Plan, 2000, as an Area of High Amenity.

The designation of the land area to the south of the N24 as an area of high amenity would appear not alone to recognise the outstanding natural beauty of significant proportions of this land area, i.e. those adjoining or overlooking the River Suir Valley, but also the unique interest value of the following characteristics of the area:

- concentration of occupied and maintained thatched houses
- historic farm village settlement pattern (see Landscape Character Areas)
- concentration of archaeological and historical remains and buildings
- cultural history of the area vis a vis the river
- human scale of the narrow winding country roads

It is the complex interaction of all the various characteristics of this landscape area that appear to justify its identification as an area of high amenity.

River Valley Landscape (Special Area of Conservation)

The wetlands and reed beds all along the River Suir are designated a Special Area of Conservation. This is primarily a habitat or ecological designation, but it also has landscape dimensions in that the reed beds in particular are a characteristic and important landscape feature of the River Suir where it adjoins the study area.

Preserved Views

The Kilkenny County Development Plan lists the views to the south, south-west and south-east in the vicinity of Granny Castle at the eastern end of the study area as being worthy of preservation (refer 5.6.6 Appendix of Sites).

Settlement Patterns

<u>Historic Settlement Patterns</u>

As already noted, the Mooncoin area of County Kilkenny features a distinct historic farm village settlement pattern, extending back prior to the 17th Century and is one of only three such areas in Ireland.

Modern Settlement Patterns

The network of roads extending southwards from the N24 to the villages of Pollrone, Doornane, Portnascully, Clasheroe, Luffany, Carrigeen, Portnahully, Ballygriffin and outside the study area to Licketstown, Ballygorey, Cussana, Corluddy, Mountniell, Glengrant and Moonveen, have all experienced significant ribbon development in recent years.

This pattern is not repeated to the same extent to the north of the N24 with the exception of the roads to Ballytarsney, north of Mooncoin.

This recent development, when coupled with existing settlements, has created a significant residential density in the area and has established what in effect is becoming a dispersed urban community rather than a series of separate village communities.

Historic Landscapes

There are a number of historical landscapes within the study area, ranging from extensive areas to quite small local settings.

Thatched cottages

Thatched cottages occur along the N24 from the eastern to the western extremities of the study area. As one of the most concentrated areas of thatched cottages in good condition and in continuous occupation in the country, this constitutes a unique historical/cultural landscape of international importance.

Churches, Graveyards, Holy wells

These occur in various locations within the study area, as already identified: Clonmore, Pollrone, Portnascully and Rathkieran. Individually these are locally significant historic landscapes which also underpin the overall landscape value of the area south of the N24.

Motte and Bailey

There is one motte located on the extreme southern margin of the study area. Its local landscape setting would be important. See figure 5.6.

Castles

The castles within the study area, notably Granny Castle at the eastern extremity and Grange Castle towards the western extremity are significant landscape features, particularly in the case of Granny Castle. See figure 5.6. The landscape context of Granny Castle has already been significantly intruded on along its northern side by the N24, but the scenic quality of its location by the side of the River Suir is so strong as to counteract this intrusion to a significant degree. The proximity of Grange Castle to a settlement area is such as to make it unlikely that it will be intruded upon.

Megalithic Tomb
The one megalithic tomb within the study area is located close to the railway track in the vicinity of Ballynearla. This would have a local landscape value.

Watermills
There is a watermill located in the vicinity of Portnascully. It is no longer operational, but the millwheel is intact, as are the series of millponds extending northwest from the mill. This is a locally important landscape.

Abandoned Quarries
There are two abandoned quarries, one in the vicinity of Granny Castle (see Appendix 3) and the second by the junction near Rathkiernan which have become naturalised and reintegrated into the landscape to some extent. These may give rise to a local landscape constraint.

Estate Landscape
In the vicinity of Clonmore at the extreme western end of the study area there is an area of estate landscape, mature trees, lodges and country mansions.

There is a pattern of such country mansions along the banks of the River Suir, more evident on the southern bank than the northern bank. The associated landscape is significant in a local context.

Country mansions with associated estate landscape also occur at Waddingstown and close to the railway line south of the megalithic tomb near Ballynearla.

Recreation/Tourism Amenities

The River Suir
The River Suir is a significant recreational/tourism amenity in relation to boating, bird watching, fishing and shooting. It is likely that these landscape-related activities are capable of significant development. It would be important that access to such an amenity would be preserved for both the local population and visitor alike.

Pollrone Pier
A significant investment has been made in the development of Pollrone Pier as an amenity for Mooncoin, and a facility for developing tourism and recreation in the area. It would obviously be important to maintain access to such an amenity for the local population and visitor alike.

The Mooncoin Way

The Poolrone Quay Development Group, in association with the Barrow, Nore, Suir Rural Development Limited, have prepared a map illustrating the Mooncoin Way which is exhibited in the Church Car Park at Mooncoin and at the Pier in Pollrone.

The Mooncoin Way links with the South Leinster Way to the north of the study area and is obviously intended to attract walkers to enjoy the amenities and scenic views of the Mooncoin area and in particular to visit the unique farm village settlement pattern, featuring many thatched cottages, and archaeological remains within the study area.

The Mooncoin Way enters the study area from Graigavine via Clonmore, on to Grange, Ballytarsney, Mooncoin, Pollrone, Durrane, Portnascully. It then travels south out of the study area through Luffany, Moonveen, Glengrant, Licketstown, Cussana, Corluddy and re-enters the study area at Carrigeen, travelling on to Clasheroe, Ballynamountain, Ballinlough, Rathkieran, on to Waddingstown, Ballinacurra, Rathcurby and leaves the study area in the direction of Ullid, to return via Ballyclaw to rejoin the South Leinster Way. It would be important to avoid any obstructions to the Mooncoin Way and to take account of the viewers traversing same.

Viewers

The issue of viewers is addressed from a number of different perspectives as follows:

Residents

Within the land area to the south of the N24, residents currently enjoy very attractive views (see figure 5.6), depending on their location, of the River Suir valley, the hills across the river around Portlaw, the Comeragh Mountains and Slievenamon in the distance.

To the north of the N24 many of the residents would enjoy views northwards to the forested hills and the South Leinster Way.

Visitors/Tourists

Visitors to the area are likely to consist of those exploring the by-road network on foot, car or bicycle together with those travelling by boat on the River Suir. Currently such visitors and tourists enjoy landscape views of very high quality with little degradation. As noted, in the description of the Mooncoin Way, walkers currently enjoy a range of attractive views at

different points, to the west, southwest, south, southeast and north. It would be important to conserve such views.

The views to be enjoyed by visitors/tourists to the north of the N24, whilst not of the same high quality, are attractive and must be taken account of in any proposed development.

Through Travellers

Through travellers would consist of those travelling on the existing N24 and the future by-pass, together with those travelling on the railway, and possibly in the future by travellers in water-bus transport on the river.

There are potentially attractive views to be enjoyed by such travellers when traversing the study area, including views of the River Suir, nearby hills and distant mountains. Such views reduce the boredom of travel and should be seen as a national, as distinct from specifically local, tourism resource.

Such views can also be seen as a way of converting passing visitors into valuable tourists in the local area, and further convey an air of local distinctiveness in the context of modern travel.

Land Use

There are a number of land use activities within the area which have landscape constraint dimensions.

Commercial Fruit Growing

Orchards, (mainly at Clonmore) are a very attractive landscape feature and involve an investment over a much longer timescale than agricultural activities and as such represent a significant landscape constraint.

Quarrying

Flemingstown - Until restoration is implemented, quarrying activities generally result in a degraded landscape and as such does not give rise to a significant landscape constraint.

Transport Infrastructure - Railway

The existing rail line is a significant landscape feature in itself with a range of associated structures such as bridges, station etc. contributing to the landscape character at various locations.

The landscape implications of the railway arise in relation to possible need for new bridges, which could be very significant in the context of the relatively flat, gently undulating landscape and therefore would need particularly careful design consideration.

Transport Infrastructure - Waterway

This is anticipating a possible future development where public transport via waterbus would be provided along the River Suir for residents in Fiddown, Portlaw, Mooncoin etc. to and from Waterford City. Such a development might have implications in a broader landscape context.

5.6.4 Conclusion

The evaluation of landscape and visual constraints within the study area for the Mooncoin bypass has resulted in the land area south of the N24 being identified as an area of very high landscape constraint.

This conclusion derives in the first instance from the designation of this area as one of high amenity within the 2000 Kilkenny Draft County Development Plan, coupled with the outcome of the research documented in this report, setting out a range of landscape features within the area, including farm villages, archaeological remains, thatched cottages, estate landscape, orchards and views and the integration of all these elements.

The individual landscape features within the area south of the N24 (area of high amenity) have a range of constraint values and these individual landscape features are largely located in a corridor extending around the southern margin of the study area and a second corridor of less intensity close to the N24.

To the north of the N24 the landscape constraints are more dispersed throughout the study area.

There is some degree of concentration in the vicinity of Mooncoin, extending to Ballinacurra, Waddingstown, Ballytarsney and Grange, an area which represents an extension of the historic village settlement otherwise concentrated south of the N24.

Minimum Zone of Proximity

The identification of the area south of the N24 as an area of very high landscape constraint creates some difficulty with regard to discussing minimum zones of proximity within this major portion of the study area.

Individual landscape features within this area of high amenity have differing minimum zones of proximity, but difficulties arise in relation to the integrated nature of this large area of landscape constraint with regard to defining zones of proximity relating to the road network which is an integral part of the landscape character of the area.

The situation is somewhat less complicated to the north of the N24 with more localised landscape constraint features.

Categorisation and Ranking of Sites

The sites are characterised first of all on the basis of the integration of a large or small number of landscape features within the study area.

In the case of this study there is a rather unusual situation whereby a significant portion of the study area (south of the N24) comprises a large number of individual landscape features which have constraint values in themselves, but have a greater constraint value when taken as an integrated unit.

The constraint ranking, as described below, takes account of the value of the landscape feature concerned and the difficulty and/or cost of resolving the landscape constraint presented.

Impact Rating	Meaning
Very High	Landscape feature likely to be internationally, or nationally important and landscape constraint very difficult or expensive to resolve.
High	Landscape feature likely to be nationally or regionally important, landscape constraint difficult and relatively expensive to resolve.
Moderate	Landscape feature likely to be of high value in a local context, landscape constraint likely to be moderately difficult and/or expensive to resolve.
Low	Landscape feature likely to be of low value, but locally important, landscape constraint relatively easily and inexpensively resolved.
Very Low	Landscape feature of low value in a local context, and landscape constraint easily resolved.

Categorisation and Ranking of Constraints

The Landscape Constraints are grouped as follows:

A Area of high amenity (study area south of N24).

B Individual sites within the area of high amenity (area south of N24)

C Individual sites outside the area of high amenity (study area north of the N24)

Notes:

- Where the constraint value has been marked with an asterisk*, it indicates that the value has been reduced due to the proximity to the location of the existing N24.
- Mooncoin village is a landscape constraint but not listed as it is to be by-passed.
- Not all farm villages dating from the pre-17th century settlement pattern have been confirmed, other smaller hamlets of similar vintage may exist in the study area
- Thatched cottages have only been noted where they have been specifically identified. It is likely that they occur in all villages and a more detailed survey would be required.

Table 5.6a Landscape and Visual Sites

Landscape Site	Very High	High	Moderate	Low	Very Low	Zone of Proximity (Km)	Comment/Reason
A. Area of High Amenity	▲					Full geographic extent	Pre-17th Century farm village settlement pattern (7 villages). Thatched cottages - unique concentration. Granny Castle (national monument) Motte & bailey (listed monument) Ancient Churches and graveyards (4) Holy Wells (2) Listed View at Granny Castle, adjoining proposed SACs at Granny and Clonmore/Pollrone. Estate landscape & orchards, Clonmore. Scenic views over the River Suir Valley and the Comeragh Mountains. The Mooncoin Way - walkers' route. Watermill and Mill-ponds - Portnascully
B. Granny Castle		▲*				0.7	National monument, listed scenic views over River Suir, proposed SAC at Granny Ferry.
Portnascully	▲					0.8	Motte & bailey (listed monument), ancient church, graveyard and nearby holy well, farm village pre-17th century, thatched cottages, disused watermill and adjoining millponds.
Pollrone	▲					0.75	Farm village pre-17th century, thatched cottages, nearby amenity pier on River Suir, nearby ancient church/holy well.
Clonmore			▲			1.2	Ancient church, graveyard & holy well, extensive orchards, country mansion, river valley landscape adjoining proposed SAC

							Clonmore/Pollrone.
Luffany		▲				0.5	Farm village pre-17th century, thatched cottages.
Doornane		▲				0.6	Farm village, pre-17th century, thatched cottages.
Portnahully		▲				0.8	Farm village, pre-17th century, thatched cottages
Rathkieran Jtn		▲				0.5	Ancient church and graveyard, disused quarry.
Aglish			▲*			0.7	Farm village, pre-17th century.
Curraghmartin			▲*			0.5	Farm village, pre-17th century.
C. Grange		▲				0.75	Ancient castle, farm village pre-17th century.
Ballytarsney		▲				0.75	Farm village pre-17th century, thatched cottages.
Waddingstown		▲				0.75	Country mansion, area of woodland, estate landscape.
Megalithic tomb		▲				0.6	Archaeological feature, nearby country mansion, estate landscape.
Arderra		▲				0.5	Farm village pre-17th century.
Rathcurby woodlands			▲			0.3 max.	Cluster of small woodlands (3).
Old limestone Quarry Granny					▲	n/a	Listed industrial archaeology Grade 4 Extensive remains of abandoned deep workings.
Working quarry, Limestone Flemingstown					▲	n/a	Very large operational limestone quarry.
Rail-line			▲			0.25 per bridge	Operational rail line with number (4+) of railway bridges and station.

5.7 SOCIO-ECONOMIC / HUMAN BEINGS

This section sets out the main socio-economic / community characteristics of the study area. These include population, local economy, employment, community facilities and tourism.

Data for this section was gathered through a windscreen survey and using 1:50,000 OS mapping of the area and literature from Bord Failte. The Kilkenny County Council Development Plan (draft 2000) was also consulted.

5.7.1 Existing Environment & Constraints

Population

The 1996 Census of Population shows that County Kilkenny's population structure is still very rural. The population of County Kilkenny has shown a net increase of 1,701 between 1991 and 1996. While 60% of this population increase occurred in Kilkenny city and environs rural areas closer to towns saw a substantial increase also.

Local Economy

Despite its proximity to Waterford City most employment within the study area is agriculturally based. Farms are well-managed with good to medium quality fertile land. Waterford City and the village of Mooncoin provide a wide range of local businesses and services. The main concerns of these include quarrying and services associated with agriculture, tourism, employment, legal and banking facilities, shopping areas and social amenities, amongst others.

Employment

According to the 1996 Census of population the Kilkenny workforce had the following characteristics;-

- A decrease in those working in agriculture has continued, falling form 26% in 1986 to 17.5% in 1996. However this figure is still 7% higher than the national average.
- 25% of those above the age of 15 hold a third level qualification as opposed to the National average of 33%.
- 34.9% of Kilkenny's workforce are employed in the white-collar sector – professional services.
- Unemployment within the County is similar to national figures. Between August 1999 and August 2000 those registered on the live register fell by 28%.

According to the Draft Development Plan the current figure, as of August 2000 is 4,508.

According to the Kilmacow Village Plan (Ref. Kilkenny Development Plan, Draft 2000), under which Mooncoin is covered, the largest proportion of agricultural employees work on farms above 50 acres.

Communities Facilities

The location of many of the community facilities within the study area such as churches, hospitals, schools and cemeteries are illustrated on Figure 5.1. Any additional facilities will be identified during the route selection phase of this project.

Mooncoin is the only village within the study area, however a number of smaller communities exist at Ballygriffin, Aglish, Filbuckstown, Portnascully, Ballybrassel, Portrone, Doornane, Grange and Ballytarsney. For the most part Mooncoin, and the majority of the study area (east of Mooncoin and north of the N24), is covered by the Kilmacow Village Plan (Ref. Kilkenny Development Plan, Draft 2000). Other communities adjacent to the study area include Waterford, Kilmacow and Portlaw. Waterford City is situated approximately 1.5 Km southeast of the study area and will be taken into consideration during the route selection study owing to its proximity to the study area, importance and size.

Tourism

For the purposes of tourism Ireland is divided into regions. Kilkenny is part of the South East region. The County is fortunate in possessing a cultural heritage of national and international significance. This is illustrated in the many sites and structures of archaeological, artistic, architectural and historic interest. In addition Kilkenny has a good reputation for high quality crafts and design.

Between 1992 and 1997 the number of tourists visiting the South East region increased by 37%. In 1999 5,943,000 overseas tourists visited Ireland. This is an increase of 7.4 % on 1998 figures. Of this number 870,000 visited the South East region with 218,000 visiting Kilkenny. The majority of these visitors came from Britain. While the remainder came from Mainland Europe, North America and other areas. Domestic and Northern Irish tourists visiting the South East region in the same year numbered 1,247,000. For 1999 the revenue generated through tourism for County Kilkenny amounted to approximately £28 million.

According to the Kilkenny County Development Plan (draft 2000) there are no major tourist attractions within the study area. However, the plan states that *"there are other areas of the County which have untapped potential and could be successfully developed in terms of a sustainable tourism product"*. The study area contains a number of potential sites of interest such as the Thatched cottages, south of the N24, Granny Castle, east of the study area, a Motte, a Megalithic tomb, watermills, churches, holy wells, etc.

5.8 TRAFFIC

This section of the report reviews the traffic constraints within the study area and takes into consideration the location and context of the study area. This section reviews and analyses existing traffic data available, future traffic data requirements and summarises the effects of the scheme on local and strategic traffic movements.

Location and Context

The N24 runs from Waterford City in the east to Limerick City in the west, providing the main strategic route from the southeast of Ireland to the western counties. It passes through key towns such as Carrick-on-Suir, Clonmel, Cahir and Tipperary and provides access to other key parts of the National Road network such as the N8 and N76.

The N24 Mooncoin Bypass study involves an assessment of a new road scheme linking the N24 Piltown – Fiddown improvement, which is currently under construction, with the proposed Waterford Bypass scheme. The route is approximately 10 km in length. The study will involve the following tasks;

- Route selection;
- Preliminary and detailed route design;
- Environmental assessment;
- Contract procurement;
- Construction supervision.

Existing Data Sources

Existing traffic data available for the Mooncoin section of N24 is limited. The National Roads Authority (NRA) has a permanent counter site on the N24 at Granny and this provides information on Annual Average Daily Traffic (AADT). This information is summarised for the years 1997 – 2000 in Figure 5.8a, together with AADT's for other locations in the immediate surrounding area. This shows that current traffic levels are approximately 8000 vehicles for a

two way AADT and that AADTs are higher during the summer months of June, July and August. This suggests that there are seasonal variations in the traffic flow due to, amongst other factor, an increase in tourist traffic.

The available data shows that the current percentage of Heavy Goods Vehicles on the N24 at Mooncoin is approximately 18%. This figure is higher than the 12% referred to in the National Roads Needs Study.

Assuming current rates of traffic growth, as outlined in the National Road Needs Study, the two-way AADT is forecast to be 19,500 vehicles in 2019 and 20,500 vehicles at saturation. This level of flow could result in the scheme proposed having to be of dual carriageway standard. This will be confirmed at a later stage of the project.

Figure 5.8a identifies the locations of traffic counters adjacent to the study area. Following are the annual average daily traffic values for each of the five locations for the years 1997 to 2000.

1.KILMAEDEN		2. DOONEEN		3. BUTLERS-TOWN		4.GRANNY		5. DUNKITT	
YEAR	AADT	YEAR	AADT	YEAR	AADT	YEAR	AADT	YEAR	AADT
1997	9,465	1997	10,962	1997	11,223	1997	6,538	1997	5,619
1998	9,516	1998	10,821	1998	9,823	1998	7,017	1998	5,896
1999	9,050	1999	10,492	1999	9,164	1999	7,007	1999	6,707
2000	***	2000	14,169	2000	***	2000	7,982	2000	7,257

*** - no data available

Accident Data

Figure 5.8b illustrates the number of accidents that have occurred within the study area from 1988 to 1999. In all there have been 31 accidents. These have been categorised as follows

- 7 fatalities
- 10 Serious injuries
- 14 Minor injuries

Observations show that there are two areas on the N24 where clusters of accidents have occurred. The first is located to the west of Mooncoin, near Mooncoin School. Five accidents have occurred in this area, two serious injuries and three minor injuries. The second area is east of Clonmore Cross Roads where there were also five accidents, four minor injuries and one fatality.

Future Data Requirements

Traffic surveys will be undertaken in Spring 2001 that will provide supplementary data to that already available. These surveys will include:

Road Side Interview Surveys – these will provide details of the origin – destination patterns of journeys taking place on the N24, highlighting the composition of traffic in terms of strategic and local movements. Details will also be collected on journey purpose and vehicle occupancy levels. The information will be used to develop trip matrices.

Automatic Traffic Counts – these will provide details of current flow levels on the N24 that will support the AADT data currently available. In addition, the information collected will allow a profile of traffic to be developed, showing how flows differ over time and by day of the week.

Manual Classified Counts – these will provide information on the composition of traffic flow in the study area, showing the percentage of total traffic in a variety of road user classes such as cars, light goods vehicles and heavy goods vehicles. The composition of traffic flows, notably the percentage of HGV's recorded will have an influence on the design of any scheme implemented.

Journey time surveys – these will provide data on current journey times along the N24 and will highlight any instances of delay that may be occurring. This data will be compared with predictions of journey times for the scheme to be implemented

Conclusion

The effects of the Mooncoin Bypass scheme are likely to impact on both local and strategic traffic. The removal of traffic from Mooncoin village itself will obviously produce a significantly improved local environment, with an anticipated decrease in noise levels. Lower levels of traffic should also lead to a reduction in conflict between the different modes of transport. Accident levels will be reduced and the safety and environment for such as pedestrians and cyclists will be improved.

The strategic effects of the scheme will be felt by longer distance traffic and should be considered in conjunction with the effects of the proposed Waterford Bypass and the Piltown – Fiddown improvements. Taken together, these improvements will significantly improve the strategic corridor between Waterford and Limerick, leading to a reduction in journey times and an increase in accessibility to the south-east of the country.

5.9 AIR QUALITY AND NOISE LEVEL SENSITIVE RECEPTORS

In this section Ordnance Survey mapping (1:50,000 scale) has been studied to identify potential sites sensitive to air quality and noise level changes normally associated with a new road scheme. Air and noise sensitive receptors tend to be the same thus for the purposes of this report the definition for noise sensitive receptors as defined by EPA has been adopted. According to the EPA noise sensitive receptors are defined as "*Any dwelling house, hotel or hostel, health building, educational establishment, places of worship or entertainment or any other facility or area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels*". (EPA Integrated Pollution Control Licensing Guidance Notes for Noise, 1995).

It is not possible to detail every sensitive receptor within the study area at this early stage thus only larger clusters of housing have been identified. All relevant receptors will be identified as part of the route evaluation stage.

Within the study area there is only one village, Mooncoin. However, there are also a number of sensitive receptors, including amongst others schools (Mooncoin), churches (Mooncoin, Pollrone, Portnascully and Ballinlough) and dwellings. Some dwelling, clusters have been identified from OS1:50,000 mapping. These include Ballygriffin, Aglish, Filbuckstown, Portnascully, Ballybrassel, Portrone, Doornane, Grange and Ballytarsney.

5.10 UTILITIES

This section of the report describes the utility constraints within the study area. Utilities were addressed under the following headings, electricity, telecommunications, gas, commercial bogs, water and sewerage.

5.10.1 Study Methodology

The statutory bodies were contacted to establish the type and location of existing services within the study area. 1:50,000 OS mapping was also reviewed. The various services are described below.

5.10.2 Existing Environment & Constraints

Electricity

The Electricity Supply Board has a number of lines within the study area. These are all 10 kV lines with the exception of the 220kV line which enters the study area north of Corluddy

and travels in and northeasterly direction until it exists the area of interest west of Dunkitt. The main 10 kV line runs parallel to the N24. In addition a number of arterial lines criss-cross the N24 and study area as a whole. At the route selection phase of this project the exact type and locations of these lines will be determined and taken into consideration.

Telecommunications

Eircom have a number of overhead lines and underground plant within the study area. The locations of these lines are as follows.

- Along third class road from Granny to railway line and along railway line travelling towards Waterford – Overhead Line.
- Along the N24 to service housing in Ballygriffin – Overhead line and underground plant.
- Along the N24 at Curraghmartin to service housing in this area, including housing along the third class road and other road north of the N24 – Overhead line (and underground plant along N24 only).
- Along third class road, south of N24, from Aglish to Clasharoe and beyond Clasharoe junction to edge of study area – Overhead line.
- Along the N24 from Curraghmartin to junction of third class roads prior to entering Mooncoin – Overhead line (and underground plant along N24 only).
- Along third class road leading from above junction to southern boarder of the study area – Overhead line.
- Along third class road from Church at the junction before entering Mooncoin to the Motte north of Portnascully – Overhead line.
- Along third class road, south of N24, from Mooncoin to Doornane and east from Doornane to motte north of Portnascully – Overhead line.
- Along third class road, south of N24, from Mooncoin to Pollrone – Overhead line.
- Along other roads after Mooncoin travelling from N24 southwards – Overhead line.
- Along third class road from Mooncoin to Grange Station and from Grange Station to Grange – Overhead line.
- Along third class road form Mooncoin to Ballytarsney and continuing on to Arderra – Overhead line.
- Along third class road from junction, before Mooncoin, to Ballincurra and Rathcurby – Overhead line.
- Along third class road from N24 at Ballynamountain to Farranmacedmond – Overhead line.

- Along length of N24 from Granny to study boundary north of Clonmore crossroads – Underground Plant.
- Along third class road at Newtown – Overhead line.
- Along third class road, north of N24, at Ballynearla – Overhead line.

Esat Digifone currently has no sites within the study area, nor do they have any in planning. However there may be a future requirement to upgrade the service in the area. A preliminary investigation suggests that two base stations would be necessary to provide coverage. As yet, however, there have been no site investigations undertaken or planning applications sought.

Esat Business has one fibre optic line within the study area which runs on Iarnrod Eireann property along the Rosslare - Limerick railway line. This line is part of the Esat Business backbone, which supplies telecommunications between Dublin and the regional towns and cities. Any work carried out on the railway will require further contact with Esat Business in order to obtain more exact details and thus avoid damage to the line.

NTL / Chorus have no cables or underground lines within the study area.

Gas

Bord Gais has one polyethylene pipe within the study area. This pipe is located along the N24 from Granny Castle as far as the first third class road south of the N24. The pipe then follows this third class road as far as Ballygriffin.

In addition Bord Gais has undertaken preliminary planning / routing for a pipeline within the study area to a proposed power station outside the area. The line of this routing enters the area under consideration north of the N24 northeast of Granny and south of the River Blackwater and travels in an approximate northeast – southwest direction until it exits the study area Southwest of Portnahully and northwest of Corluddy. At this stage these plans / routes are only preliminary and no approval has been received to date.

Commercial Bogs

Bord na Mona do not own or operate any bogs within the study area.

Water and Sewerage

The sanitary services division of Kilkenny County Council was contacted and details of the existing water supply facilities and sewerage schemes within the study area were obtained. The locations of these facilities and schemes are as follows:

- Along whole section of N24 servicing the study area – water mains 4" to 8" AC.
- Along third class road south of N24 to service Ballygriffin area – water mains 6" PC.
- Along third class road from Kilmacow travelling towards Flemingstown and other roads servicing Newtown area – water mains 1" to 2" PVC.
- Along third class road form Kilmacow servicing Ballynearla – water mains 1" PVC.
- Along third class road, south of N24, from Aglish to Clasharoe – water main 2" diapolythene.
- Along third class road from Ballynamountain bridge to Rathcurby House T-junction and along third class roads travelling east and west at this junction – water mains 2" to 3" PVC.
- Along third class road north of N24 and railway line from Rathcurby North to Kilmacow – water main 2" PVC.
- Along third class roads south of N24 servicing Ballinlough, Ballynamountain and Rathkieran – water mains 5" AC and 2" PVC respectively.
- Along 'other' road north of N24 travelling towards Ballincurra – water main 2".
- Along N24 from Filbuckstown servicing Mooncoin – Foul sewer.
- Along third class road south of N24 travelling towards Doornane – water main 2" to 4" PVC and foul sewer (Outfall to river Suir from this line).
- Along third class roads from Mooncoin north and south of N24 – water mains 4" to 6" AC.
- Along third class roads from Mooncoin north of N24 travelling towards Grange and Silversprings – water mains 4" to 6" AC and foul sewer as far as Ballytarsney.
- Along third class road from Mooncoin travelling towards Pollrone – water main 4" AC.
- Along third class road from Clonmore Crossroads north of N24 – water main.

While the study area is served by two major public water schemes (the Mooncoin regional water supply scheme and the Piltown / Fiddown water supply scheme), their abstraction points lie to the north of the study area. The abstraction points for the Mooncoin regional scheme are at Mullinavat from the River Blackwater and at Ballyhimmin from the River Pollanassa. The abstraction point for the Piltown/Fiddown Scheme is at Raheen, the source being springs.

The outfall points for the Mooncoin and Fiddown Wastewater treatment plants are located at National Grid references S 499 144 and S 468 197 respectively. The outfall point for the proposed Kilmacow wastewater treatment plant is at S 567 172.

5.11 PLANNING AND LAND OWNERSHIP

All applications submitted to the County Council are recorded on 1:2,500 Ordnance Survey Sheets. Information recorded by the planning department includes details of the type of development proposed, the name of the developer and the status of the application, i.e. if the permission has been refused or granted and any conditions which may be attached.

Planning application information in conjunction with a register of land ownership within the study area will be obtained and utilised during the route selection process.

6.0 PUBLIC CONSULTATION

6.1 INTRODUCTION

An important part of the Constraints phase of any road project is the public consultation. The purpose of this event is to introduce the scheme, initiate a two-way information transfer process, involve the public at the preliminary stage of the scheme development process, inform them of the various statutory and other steps that will arise, inform them of the likely time scales and seek their general co-operation, understanding and comments on matters of particular local concern and sensitivity.

In order to advertise the public information days, leaflets were distributed to residences and businesses within the study area and advertisements were placed in local newspapers. A meeting with the elected Members and other relevant personnel from Kilkenny County Council was held on Monday 9th April 2001 in the Community Hall in Mooncoin. Two public information days were also undertaken on Tuesday 10th and Wednesday 11th of April 2001 also in the Community Hall in Mooncoin. In total there were 253 persons registered as attending.

Members of the design team and Local Authority liaison team were on hand at the public consultation to outline the scale and extent of the constraints study, deal with questions and concerns raised by the public and record their comments for future consideration. In addition brochures, questionnaires and freepost envelopes were distributed in which attendees and interested parties were invited to make their views known to the design team. Submissions were requested to be returned by Friday 4th May 2001.

Information boards were on display to summarise the work completed to date and to highlight findings from the desk studies undertaken for the constraints study. A number of these boards (A0 reproduction of the drawings in this report) depicted the locations of potential sites of interest for each of the following constraints: -

- Geology, Hydrogeology and Soils
- Archaeology
- Ecology
- Landscape and Visual

A calendar of key programme items was also presented along with a cross section to provide a visual indication as to the type of road that could be expected.

6.2 MAIN ISSUES ARISING FROM THE PUBLIC CONSULTATION

A total of 36 written submissions were received from individuals and interested parties. These submissions were categorised as follows:-

Table 6.1 Categories of Submissions Received

Category No.	Categories	No. Received	% of Total
1	No Objection – No Comment	16	44
2	No Objection – Information Supplied	5	14
3	Objection - No Comments	0	0
4	Objection – Information Supplied	6	17
5	Objection – Upgrade the Existing Road	2	5
6	Road through Bog and Other Route Options Recommended	0	0
7	Farm Severance	6	17
8	Loss of Passing Trade	1	3

Forty four percent of the submissions received left the comments box on the questionnaire blank. These submissions were categorised as No Objection – No Comment. Thirty one percent of the submissions received provided the design team with information on potential architectural, archaeological and ecological sites as well as places of local high amenity, interest and importance. A number of submissions provided locations and reference numbers for these sites. This information will be very useful when identifying and locating sites that have been brought to the design team's attention during the public consultation. Where sites of local interest and importance were commented upon the reasoning behind this importance was, in some cases, discussed. Other comments received during the public consultation related to the existing use of the N24 by locals and businesses within the area. In many of these cases access requirements to the N24 and the proposed road were outlined.

Fourteen percent of these did not object to the proposed scheme while seventeen percent did. Of the remaining twenty five percent of submissions received, twenty percent commented upon farm severance and the potential loss of passing trade and five percent objected to the proposed new road or suggested upgrading of the existing road.

All of the comments received and sites identified during the public consultation are currently being studied and cross-referenced against those identified during the desk study phase of the constraints study. If sites identified during the public consultation were not previously identified during the desk studies these will be taken into consideration during the route selection study.

6.3 ACTION IN RESPONSE TO SUBMISSIONS MADE

All information received during the public consultation stage will be assessed and where appropriate will be taken into consideration during the route selection phase of the project. Kilenny County Council made a written acknowledgement to interested parties and each member of the public who returned a questionnaire

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N24

Mooncoin Bypass

Road Improvement Scheme

Constraints Study Report

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KILKENNY COUNTY COUNCIL
Comhairle Chontae Chill Chainnigh

TRAMORE HOUSE
REGIONAL DESIGN OFFICE

September 2001

MALONE O'REGAN
Scott Wilson
..... in Ireland

N24

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KILKENNY COUNTY COUNCIL
Comhairle Chontae Chill Chainnigh

TRAMORE HOUSE
REGIONAL DESIGN OFFICE

September 2001

MALONE O'REGAN
Scott Wilson
..... in Ireland

EXPLANATION OF TERMS

APPENDIX 1A ARCHAEOLOGY

Site: Reference number, the first two letters refer to the county in which the site archaeological site is located e.g. Kilkenny (KK).

Townland: The name of the townland in which the archaeological site is located.

County: The name of the county in which the archaeological site is located.

O.S. 6" Sheet: Ordnance Survey 6" Sheet on which the SMR site is identified. The number of the OS 6" sheet is given here.

Plan: Sheet reference co-ordinate.

Trace: Sheet reference co-ordinate.

NGR: National Grid Reference.

Identification: The method used to detect the archaeological site e.g. documentary, aerial photography.

Type: The type of archaeological sites e.g. ringfort, enclosure, ecclesiastical remains.

RMP No.: The abbreviation RMP refers to the national archaeological survey's registration of the site, namely its Record of Monuments and Places number.

Description: Details of the site.

APPENDIX 1B ARCHITECTURAL HERITAGE

Name: Name of the listed building and/or structures.

Item: Details of the item.

Rating: Classification of the listed building and/ or structure e.g. regional importance, national importance, local importance.

Map Ref.: Map reference.

APPENDIX 1C CATALOGUE OF ARTIFACTS FROM NATIONAL MUSEUM OF IRELAND TOPOGRAPHICAL FILES

Townland: The name of the townland in which the artifact was located.

OS 6" Sheet: Ordnance Survey 6" Sheet on which the location of the artifact was identified. The number of the OS 6" sheet is given here.

Co-ordinates: Co-ordinates on sheet.

Reg. No.: Artifact registration number.

Acquisition: Source of artifact.

Monument: Type of monument e.g. moat, ringfort and church

Artifact: Type of artifact e.g. bronze sword, leather shoe and wooden spade

APPENDIX 1A
Catalogue of Archaeological Sites

SITE	**KK042-002(01-04)**
TOWNLAND	Grange
COUNTY	Kilkenny
O.S. 6" SHEET	42
PLAN	03
TRACE	04
NGR	249920/118930
IDENTIFICATION	Documentary
TYPE	Ecclesiastical Remains
RMP NO.	KK042-002(01-04) & Listed in KCC Dev. Plan

DESCRIPTION

The ruined remains of a rectangular church (int. dims 12m NW-SW x 6m NE-SW; wall T. 0.8m) constructed of granite rubble, randomly coursed, upstanding remains comprise grassed-over wall footings of NE wall (max H. 0.65m); NW gable (max H. 3.4m), breached, indicating position of former window; SW wall (max H. 0.5m); and SE gable which averages 1m in height and houses a rectangular limestone slab on internal face. There is no indication of the position of a former entrance and no surviving fenestration of church. The interior is strewn with collapsed 19th century headstones and a Bullaun Stone. This stone is a large roughly triangular shaped granite boulder with tilting surface containing a single shallow oval-shaped bullaun. According to Carrigan this church and graveyard were once enclosed by a circular earthen bank and fosse of which no trace now remains above ground (Carrigan, 1905)

SITE	**Kk042-003**
TOWNLAND	Grange
COUNTY	Kilkenny
O.S. 6" SHEET	42
PLAN	07
TRACE	01
NGR	249720/118070
IDENTIFICATION	Extant
TYPE	Tower House
RMP NO.	KK042-003

DESCRIPTION

Situated on relatively level ground with limited views of the countryside. The tower house (in. dims c.8.35m NW-SE x 5.5m NE-SW; wall T 1.6m) now comprises just the remains of the heavily ivy-clad SE and SW walls standing to first floor level. The walls are constructed of randomly coursed limestone rubble and gritty lime mortar. The western end of a semi-pointes vault is visible over the ground floor and joist holes in the SW wall suggest a loft just under the vault. The survival of architectural features is poor with the remains of a roughly executed single-light rectangular window with a widely splayed embrasure and flat lintelled head in the SE wall and a small rectangular ope set into a splayed, round-headed embrasure at ground floor level. A single light window can also be seen through the ivy in the SE wall at first floor level.

SITE	**KK042-004(01-03)**
TOWNLAND	Kilcraggan
COUNTY	Kilkenny
O.S. 6" SHEET	42
PLAN	07
TRACE	06
NGR	251760/117920
IDENTIFICATION	Cartographic
TYPE	Tower House and Dwellings
RMP NO.	KK042-004(01-03)

DESCRIPTION

One dwelling is said to have been built about 1690 by a Cromwellian family. It was remodeled c. 1850, when a third storey was taken down. Kilcraggan Castle (kko42:00401) adjoins it on the north, extending thence across a car-way (Carrigan, 1905, 155). The three sites are marked on the OS 6" maps and the Downe Survey map, 1650.

SITE	**KK042-006(01-02)**
TOWNLAND	Clonmore
COUNTY	Kilkenny
O.S. 6" SHEET	42
PLAN	06
TRACE	05
NGR	248550/117280
IDENTIFICATION	Extant
TYPE	Ecclesiastical Remains
RMP NO.	KK042-006(01-01)

DESCRIPTION

Ruined nave and chancel church standing within a large rectangular graveyard which is enclosed by an earthen bank and hedgerow. The earliest visible gravestone dates to 1746 and the latest to 1817. The church is a plain nave and chancel structure (int. dims 15.5m E-w x c.6m N-S) built of randomly coursed granite with large rough blocks used as quoins. The ruinous nave (int. dims 7.75m x 6m; wall T 0.87m) is separated from the chancel (int. dims 5.5m N-S; wall T 0.85m) by a chancel wall (wall T 0.77m) which appears to be a later addition to the church. Access from the nave to the chancel is through a late rectangular doorway (dims 1.85m x 1.31m) inserted into the centre of the chancel wall. Both this and joist holes which appear on either face of the wall (indicating a loft over the chancel) suggest the church may have been used at some point as a dwelling or for storage. The E gable stands to its full height. It contains a round-headed single-light window of Transitional type. It is set into a widely splayed embrasure the head of which is composed of cut and chamfered voussoirs. The S wall has collapsed and is now no more than 1m in height at its E and W ends. The N wall stands almost to full height and is featureless apart from a 19th century limestone memorial incorporated into its external face. The nave end of the church is quite ruinous with the W gable standing no more than 0.6m over ground level. Likewise the central portion of the N wall has collapsed and both the E and W ends are just 1m high. There are three 19th century graves within the church interior – a table tomb, a slab and another, now half-buried slab.

SITE	**KK042-007**
TOWNLAND	Clonmore
COUNTY	Kilkenny
O.S. 6" SHEET	42
PLAN	06
TRACE	05
NGR	248690/117300
IDENTIFICATION	Documentary
TYPE	Holy Well (site of)
RMP NO.	KK042-007 & Listed in KCC Dev. Plan

DESCRIPTION

A holy well called Tiobraid Channigh dedicated to St. Canice of Kilkenny was formerly situated in the field E of Clonmore church. The land in the area of the well has been reclaimed. The well itself has been infilled and a marshy patch of ground indicates its position.

SITE	**KK042-008**
TOWNLAND	Clonmore
COUNTY	Kilkenny
O.S. 6" SHEET	42
PLAN	-
TRACE	02
NGR	248590/116950
IDENTIFICATION	Documentary
TYPE	Mansion
RMP NO.	KK042-008

DESCRIPTION

According to Carrigan the Episcopal mansion at Clonmore remained and retained, in good preservation, many of its older features during his visit (Carrigan, 1905, 148). No details of its current state were located during desk study.

SITE	**KK042-009**
TOWNLAND	Ballytarsney
COUNTY	Kilkenny
O.S. 6" SHEET	42
PLAN	07
TRACE	05
NGR	250530/1172800
IDENTIFICATION	Aerial photograph
TYPE	Enclosure
RMP NO.	KK042-009

DESCRIPTION

Identified through Aerial photograph (CUCAP ASZ 96 1967). No further details were available.

SITE	**KK042-010(01-02)**
TOWNLAND	Ballytarsney
COUNTY	Kilkenny
O.S. 6" SHEET	42
PLAN	11
TRACE	02
NGR	251090/116720
IDENTIFICATION	Documentary
TYPE	Ecclesiastical Remains
RMP NO.	KK042-010

DESCRIPTION

Situated in relatively flat pasture land offering a good view from W-N. The remains at Ballytarsney comprise a rectangular graveyard still in use and a raised area at it SE end which indicates the position of the former church. This church is situated at the SE end of the graveyard and is aligned ESE-WNW. A 4m length of the wall footings of the SE wall is visible standing to a height of no more than 0.30m. What survives indicates that the walls were randomly coursed granite. Elsewhere late 18th and 19th century headstones generally overlie the foundations. The graveyard is enclosed by a stonewall and entered at the S corner. The NW corner in particular is still used for burial. The earlier 18th and 19th century headstones concentrate at the higher SE end of the graveyard. The church is marked on the Downe Survey map of 1650.

SITE	**KK042-011(01-05)**
TOWNLAND	Pollrone
COUNTY	Kilkenny
O.S. 6" SHEET	42
PLAN	14
TRACE	03
NGR	249290/115420
IDENTIFICATION	Cartographic
TYPE	Ecclesiastical Remains
RMP NO.	KK042-011(01-05) & Listed in KCC Dev. Plan

DESCRIPTION

Situated on the upper reaches of a SE facing slope overlooking the River Suir from the S-W-NW. The church and graveyard have recently been cleaned up. The church has a long rectangular undivided nave and chancel building (int. dims 14m E-W x 7m N-S; wall T c.0.9m) constructed of randomly coursed granite blocks with traces of plaster rendering externally. The masonry of the sidewalls has recently been subjected to repointing with concrete. The remains comprise the N and S walls and the much modified E gable. There is no trace of the W gable above ground level. The E gable contains a pointed arch (dims 3.10m x 3m) which represents the rough uncut embrasure of the former E window. There are trace mortar impressions of plan-centring on the soffit. The N wall has a single light window at its E end which has been repaired with concrete. The head of the embrasure is composed of shale and granite and again the soffit bears traces of plank-centring. The church was entered from this side through a roughly formed, round-headed doorway (dims 1.8m x 0.9m). On the opposite side in the S wall there is an identical doorway. A breach at the E end of the S wall indicates the position of the former window. The surrounding graveyard is enclosed by a stone wall and entered at the E end of the side. It contains largely 18th to 20th century gravestones and uninscribed markers which tend to concentrate in the area immediately S of the

church. A number of architectural fragments including a single-light window head were re-used as grave markers. At the foot of the external face of the E wall of the church there is a small bullaun stone which turned up during graveyard clearance. Nine fragments of a table top tomb lie in fragments; seven are heaped in the NE corner of the church and the largest two portions are presently resting on a base of cavity blocks, together with one side panel, outside the E gable of the church. The end panels of the tomb also lie in the NE corner of the church.

SITE	**KK042-012**
TOWNLAND	Waddingstown
COUNTY	Kilkenny
O.S. 6" SHEET	42
PLAN	12
TRACE	04
NGR	252630/115760
IDENTIFICATION	DOCUMENTARY
TYPE	Holy Well
RMP NO.	KK042-012

DESCRIPTION

St Kierans Holy Well (Tubberkeerawn) was located to the S of Rathkieran churchyard, beside the public road leading to Ballinlough. This well has been destroyed (Carrigan, 1905, 160).

SITE	**KK042-013(01-03)**
TOWNLAND	Rathkieran
COUNTY	Kilkenny
O.S. 6" SHEET	42
PLAN	16
TRACE	01
NGR	252580/115530
IDENTIFICATION	Cartographic
TYPE	Ecclesiastical Remains
RMP NO.	KK042-013 & Listed in KCC Dev. Plan

DESCRIPTION

The remains at the site include the W gable of a Protestant church which was built in 1727 on the site of an earlier medieval church; a large graveyard in poor condition; and the disarticulated components of a 17th century altar tomb (lid, end panels and side panels) re-used as individual headstones. The church is situated towards the W end of the graveyard. The remains comprise of the W gable and just the rudiments of the returns of the N and S walls. A grass covered rectangular platform (dims c.15m E-W x 6.5m NS) outlines the rest of the structure. The west gable (wall T 0.84m) is constructed of randomly coursed granite intermixed with some limestone. During the rebuilding of the church in the early 18th century a large round headed arched entrance (Wth 2.3m) of uncut stone was inserted into the gable. An additional arch with redbrick head was built against the internal face of the gable. The graveyard consists of a large roughly rectangular area which covers the greater part of the summit of the hill and extends over its E downslope. Enclosed by a stone wall and entered at the W end of the S side. Most visible headstones date between the 18th and 20th century. Also several uninscribed grave markers, probably masonry blocks taken from the ruined church. Five separate parts of what is likely to be a single 17th century altar tomb are re-used as headstones. The lid is embedded in the ground within the platform area.

SITE	**KK042-014**
TOWNLAND	Rathkieran
COUNTY	Kilkenny
O.S. 6" SHEET	42
PLAN	15
TRACE	06
NGR	252040/114690
IDENTIFICATION	Aerial photograph
TYPE	Fulacht Fiadh
RMP NO.	KK042-014

DESCRIPTION

This site was identified through aerial photography (CUCAP S700 roll 72 print 1). It is also located on the first and second editions of the OS 6" maps. No information was available on the current status of this site.

SITE	**KK042-015**
TOWNLAND	Ballinlough
COUNTY	Kilkenny
O.S. 6" SHEET	42
PLAN	16
TRACE	05
NGR	253070/114680
IDENTIFICATION	Aerial photograph
TYPE	Fulacht Fiadh
RMP NO.	KK042-015

DESCRIPTION

This site was identified through aerial photography (CUCAP roll 72 print 3). It was also located on both first and second editions of the OS 6" map for this area. No details on its current status were available.

SITE	**KK042-016(01-02)**
TOWNLAND	Aglish South
COUNTY	Kilkenny
O.S. 6" SHEET	42
PLAN	16
TRACE	06
NGR	254450/114690
IDENTIFICATION	Documentary
TYPE	Ecclesiastical Remains
RMP NO.	KK042-016(01-02)

DESCRIPTION

The church, once the parish church and situated in the village of Aglish, was located partly on a piece of land called the Rillig (the graveyard). During Carrigans visit only the foundations of the church were traced and the graveyard was no longer used. Part of the graveyard was under tillage and part encroached upon by village houses (Carrigan, 1905, 163-5).

SITE	**KK042-017**
TOWNLAND	Portnascully
COUNTY	Kilkenny
O.S. 6" SHEET	42
PLAN	15
TRACE	03
NGR	251590/113930
IDENTIFICATION	Cartographic
TYPE	Motte and Bailey
RMP NO.	KK042-018 Listed in Kilkenny County Development Plan as a Monument to be protected by Listing Orders/Regulations

DESCRIPTION
This site is marked on the first and second editions of the OS 6" maps for this area. No further information was available in file. See also site KK045-001.

SITE	**KK042-018**
TOWNLAND	Portnascully
COUNTY	Kilkenny
O.S. 6" SHEET	42
PLAN	-
TRACE	06
NGR	251940/113940
IDENTIFICATION	Cartographic
TYPE	Ecclesiastical Remains
RMP NO.	KK042-018

DESCRIPTION
A church in ruins is marked on the first and second editions of the OS 6" maps for this area and also on the Downe Survey map of 1650. No other information was available in file. See also KK045-002.

SITE	**KK042-035**
TOWNLAND	Portnascully
COUNTY	Kilkenny
O.S. 6" SHEET	42
PLAN	15
TRACE	06
NGR	251880/114060
IDENTIFICATION	Cartographic
TYPE	Holy Well
RMP NO.	KK042-035

DESCRIPTION
This site is marked on both editions of the OS 6"maps for this region as Tobernakill. No further information was given in file.

SITE	**KK042-049**
TOWNLAND	Kilcraggan
COUNTY	Kilkenny
O.S. 6" SHEET	42
PLAN	07
TRACE	06
NGR	251530/117310
IDENTIFICATION	Cartographic
TYPE	Ringfort
RMP NO.	KK042-049

DESCRIPTION

A ringfort is marked on both first and second editions of the OS 6" maps for this area. There is no other information in the file.

SITE	**KK042-050**
TOWNLAND	Rathcurby South
COUNTY	Kilkenny
O.S. 6" SHEET	42
PLAN	12
TRACE	03
NGR	254070/116990
IDENTIFICATION	Cartographic
TYPE	Megalithic Structure
RMP NO.	KK042-050

DESCRIPTION

A note attached to an old "archaeological map" suggests this was either a megalithic structure or a mass rock used in penal times. It has been destroyed. No further information was available.

SITE	**KK042-051**
TOWNLAND	Waddingston
COUNTY	Kilkenny
O.S. 6" SHEET	42
PLAN	12
TRACE	01
NGR	252540/116500
IDENTIFICATION	Cartographic
TYPE	Souterrain
RMP NO.	KK042-051

DESCRIPTION

A note attached to an old "archaeological map" suggests this souterrain continues for a considerable distance underground but the entrance is very disturbed due to animal activity. No further information was supplied in the file.

SITE	**KK043-022(01-02)**
TOWNLAND	Dungooly
COUNTY	Kilkenny
O.S. 6" SHEET	43
PLAN	13
TRACE	01
NGR	254700/115350
IDENTIFICATION	Aerial Photograph
TYPE	Enclosure (site)
RMP NO.	KK043-022

DESCRIPTION
Three enclosures were identified on aerial photograph (CUCAP AYK 41).

SITE	**KK043-023(01-02)**
TOWNLAND	Aglish North
COUNTY	Kilkenny
O.S. 6" SHEET	43
PLAN	13
TRACE	02
NGR	255520/115060
IDENTIFICATION	NMI survey
TYPE	Fulacht Fiadh
RMP NO.	KK043-023

DESCRIPTION
These sites were identified in the National Museum of Irelands fulachta fiadh survey. No further details were available in the file.

SITE	**KK043-024**
TOWNLAND	Aglish North
COUNTY	Kilkenny
O.S. 6" SHEET	43
PLAN	13
TRACE	02
NGR	255620/11480
IDENTIFICATION	NMI survey
TYPE	Fulacht Fiadh (site)
RMP NO.	KK043-024

DESCRIPTION
This site was identified in the National Museum of Irelands fulachta fiadh survey. No further details were available in the file.

SITE	**KK043-025**
TOWNLAND	Curraghmartin
COUNTY	Kilkenny
O.S. 6" SHEET	43
PLAN	13
TRACE	05
NGR	255800/11450

IDENTIFICATION	NMI Survey
TYPE	Fulacht Fiadh (site)
RMP NO.	KK043-025

DESCRIPTION
This site was identified in the National Museum of Irelands fulacht fiadh survey. No other details were in file.

SITE	**KK043-026(01-02)**
TOWNLAND	Curraghmartin
COUNTY	Kilkenny
O.S. 6" SHEET	43
PLAN	13
TRACE	05
NGR	255850/114040
IDENTIFICATION	NMI Survey
TYPE	Fulacht Fiadh (site)
RMP NO.	KK043-026

DESCRIPTION
These sites were identified in the National Museum of Irelands fulachta fiadh survey. No further details are available in file.

SITE	**KK043-027**
TOWNLAND	Ballygriffin
COUNTY	Kilkenny
O.S. 6" SHEET	43
PLAN	13
TRACE	05
NGR	256010/114670
IDENTIFICATION	NMI Survey
TYPE	Fulacht Fiadh (site)
RMP NO.	KK043-027

DESCRIPTION
This site was identified in the National Museum of Irelands fulachta fiadh survey. No further details are available from file.

SITE	**KK043-028**
TOWNLAND	Granny
COUNTY	Kilkenny
O.S. 6" SHEET	43
PLAN	13
TRACE	03
NGR	25623/11494
IDENTIFICATION	NMI Survey
TYPE	Fulacht Fiadh
RMP NO.	KK043-028

DESCRIPTION
This site was identified in the National Museum of Irelands fulacht fiadh survey. No further details are available from file.

SITE	**KK043-029**
TOWNLAND	Granny
COUNTY	Kilkenny
O.S. 6" SHEET	43
PLAN	13
TRACE	03
NGR	256450/115160
IDENTIFICATION	NMI Survey
TYPE	Fulacht Fiadh
RMP NO.	KK043-029

DESCRIPTION

This site was identified during the National Museum of Irelands fulachta fiadh survey. No further details are available in file.

SITE	**KK043-030**
TOWNLAND	Ballygriffin
COUNTY	Kilkenny
O.S. 6" SHEET	43
PLAN	13
TRACE	05
NGR	256220/114700
IDENTIFICATION	NMI Survey
TYPE	Fulacht Fiadh (site)
RMP NO.	KK043-030

DESCRIPTION

This site was identified during the National Museum of Irelands fulachta fiadh survey. No further details are available in file.

SITE	**KK043-031**
TOWNLAND	Granny
COUNTY	Kilkenny
O.S. 6" SHEET	43
PLAN	13
TRACE	03
NGR	256460/114840
IDENTIFICATION	NMI Survey
TYPE	Fulacht Fiadh (site)
RMP NO.	KK043-031

DESCRIPTION

This site was identified during the National Museum of Irelands fulachta fiadh survey. No further details are available in file.

SITE	**KK043-032(01-02)**
TOWNLAND	Ballygriffin
COUNTY	Kilkenny
O.S. 6" SHEET	43
PLAN	13
TRACE	06
NGR	256500/114600
IDENTIFICATION	NMI Survey
TYPE	Fulacht Fiadh (site)
RMP NO.	KK043-032

DESCRIPTION

These sites was identified during the National Museum of Irelands fulachta fiadh survey. No further details are available in file.

SITE	**KK043-033**
TOWNLAND	Granny
COUNTY	Kilkenny
O.S. 6" SHEET	43
PLAN	13
TRACE	06
NGR	256630/114650
IDENTIFICATION	NMI Survey
TYPE	Fulacht Fiadh (site)
RMP NO.	KK043-033

DESCRIPTION

This site was identified during the National Museum of Irelands fulachta fiadh survey. No further details are available in file.

SITE	**KK043-034(01-02)**
TOWNLAND	Granny
COUNTY	Kilkenny
O.S. 6" SHEET	43
PLAN	14
TRACE	04
NGR	257330/114630
IDENTIFICATION	Documentary
TYPE	Castle and Dwelling
RMP NO.	KK043-034 (National Monument No. 253) & Listed in KCC Dev. Plan

DESCRIPTION

This castle is said to have been built by Pierce, Earl of Ormond. His Countess, Margaret Fitzgerald, held the trials of rebels in its hall. Six houses are marked on the Downe Survey map of 1650 at this location.

SITE	**KK045-001**
TOWNLAND	Portnascully
COUNTY	Kilkenny
O.S. 6" SHEET	43
PLAN	03
TRACE	03
NGR	251550/113910
IDENTIFICATION	Documentary
TYPE	Motte and Bailey
RMP NO.	KK045-001 & Listed in KCC Dev. Plan

DESCRIPTION

Portnascully rath lends its name to the townland. The site is described as an "immense circuit, fosse, deep and wide and lofty protecting citadel, is one of the finest and best preserved specimens of ancient earthen fortifications, or ports, that our Diocese can boast of" (Carrigan, 1905, 161). In 1909 Orpen described the Motte as being 30 feet high, with its flat top being 12 paces in diameter. It has a raised bailey, roughly rectangular – one side defended by a stream, the other side by a wide ditch, banked on both sides. A depression in the motte may have once been the location of a bridge (Orpen, 1990, 313-42). See also site KK042-017.

SITE	**KK045-002(01-03)**
TOWNLAND	Portnascully
COUNTY	Kilkenny
O.S. 6" SHEET	43
PLAN	03
TRACE	03
NGR	251980/113920
IDENTIFICATION	Documentary
TYPE	Ecclesiastical Remains
RMP NO.	KK045-002 & Listed in KCC Dev. Plan

DESCRIPTION

In 1240 the "chapel of the castle of Polsculi" was appropriated to the nunnery of Kilkilliheen. This was the parish church of Portnascully and consisted of a nave and chancel, the nave being now destroyed. According to Carrigan in 1905 the chancel was 23 feet in length externally and 16 feet and 3 inches internally, the walls being 2 feet and 8 inches thick. The window in the E gable is four and a half feet high, very narrow and framed with cut stone. The choir arch was perfect, being very low and framed with chiselled stone. The holy water stoup was located beside the graveyard stile and comprises of a large rough rock with an artificial basin. The graveyard contains many inscribed headstones but none of them ancient. (Carrigan, 1905, 161)

SITE	**KK045-008**
TOWNLAND	Luffany
COUNTY	Kilkenny
O.S. 6” SHEET	43
PLAN	04
TRACE	01
NGR	252580/113480
IDENTIFICATION	NMI Survey
TYPE	Fulacht Fiadh (site)
RMP NO.	KK045-008

DESCRIPTION

This site was located on both first and second editions of the OS 6” maps for this region. It was also identified during the National Museum of Irelands fulachta fiadh survey.

SITE	**KK045-012**
TOWNLAND	Luffany
COUNTY	Kilkenny
O.S. 6” SHEET	43
PLAN	04
TRACE	05
NGR	253110/112670
IDENTIFICATION	NMI Survey
TYPE	Fulacht Fiadh (site)
RMP NO.	KK045-012

DESCRIPTION

This site was located on both first and second editions of the OS 6” maps for this region. It was also identified during the National Museum of Irelands fulachta fiadh survey.

APPENDIX 1B

Catalogue of Architectural Heritage

Listed in the Kilkenny County Council Development Plan 1999

CATHOLIC CHURCHES

No.	Td. Name	Item	Rating	Map Ref.
AH1	Mooncoin Village	Catholic Church – single cell. Dated 1869	International importance	23.S.50.16 NGR 250500/ 116160

INDUSTRIAL ARCHAEOLOGY

No.	Td.Name	Item	Rating	Map Ref.
AH2	Granny	Limestone Quarry	Listed as Grade 4 – i.e. being of Medium/Local merit	NGR 257740/ 114900

APPENDIX 1C

Catalogue of Artefacts from National Museum of Ireland Topographical Files

No.	Townland	OS 6" Sheet	Co-ordinates	Reg. No.	Acquisition	Monument	Artefact
1	Aglish North	42, 43	-	1968:16	Gift	-	Bronze ring
2	Aglish South	42	-	1976:517	Gift	Beside ruins of Aglish Church	Utilized stone
3	Ballygriffin	43, 46	-	1970:220	Gift	-	Flint scraper
4	Ballygriffin	43, 46	-	1970:188	Gift	-	Flint flake
5	Ballygriffin	43, 46	-	1971:999 1971:1000	Gift	-	Flint pebble Flint wast flake
6	Ballygriffin	43, 46	-	1971:989-998	Gift	-	15 glazed potsherds
7	Ballygriffin	43, 46	-	1972:135-147	Gift	-	Iron axehead, Iron knife blades, 9 potsherds, Animal bones, Grooved stone
8	Curraghmartin	43, 46	-	1968:13-15	Gift	-	2 pieces of bronze strip, 1 piece sheet bronze
9	Doornane	42	-	1968:12	Purchased	-	Bronze skillet
10	Granny	43	-	1973:18-22	Gift	-	Stone wig-curler, Bronze strip, 3 glazed potsherds
11	Granny	43, 46	-	1973:13	Gift	-	Ceramic (candle stick) base
12	Granny	-	-	1972:153-4	Gift	-	2 rimsherds

13	Granny	-	-	1972:149	-	-	Net-sinker, concrete, modern
14	Granny	43, 46	-	1972:126-134	-	-	2 whetstones, 3 flint objects, 3 pieces vitreas matter, 2 iron objects, 1 bronze object
15	Granny	43	-	1972:64	Gift	-	Hammerstone
16	Granny	42	-	1972:29	Gift	-	Gun flint
17	Granny	43	-	1971:1031-1038	Gift	-	Miscellaneous objects
18	Granny	43, 46	-	1971:1025-1027	Gift	-	2 glazed potsherds, 1 unglazed potherd
19	Granny	43, 46	-	1971:1001-1004	Gift	-	Iron fragment, 2 pieces iron slag, glazed rimsherd, 1 waste flint flake
20	Granny	43, 46	-	1971:976-983	Gift	-	Potsherds, Bronze finger ring, Bronze disc, Iron object, Flint artefacts, Iron knife blade
21	Granny	43, 46	-	1971:960-973	Gift	-	Flints, Potsherds, Glass fragment, Rim fragment of bronze vessel

APPENDIX 1D
List of Sites and their Corresponding Categories

Towards the maximisation of archaeological mitigation measures at an early stage in the project the archaeological sites included in this study are divided into three categories.

Category 1 consists of sites that should be avoided on the basis of their status (National Monuments), or/and their very substantial, surviving, upstanding remains, or/and their very high archaeological potential. Additionally it is considered that some of these sites may have local historical/folklore associations.

Category 2 consists of sites that should be avoided on the basis of the considerable extent of surviving remains and/or their high archaeological potential. Additionally it is considered that some of these sites may have local historical/folklore associations.

Category 3 consists of the remaining of the RMP Sites included in this study. Most of these sites have high archaeological potential and should be avoided if possible.

It has been recommended that all RMP Sites contained in this study be avoided as all archaeological sites have potential and the same status under the law (Protected under Section 12 of the National Monuments (Amendments) Act 1994). However 16 archaeological sites of the 37 identified within the constraints area, are worthy of additional consideration during the process of route option selection, (those highlighted below in Category 1 & 2). Additionally a buffer zone surrounding all 37 RMP Sites of at least 30m is recommended.

Sites have been assigned to each of the categories as defined, using the information as included in the catalogue of this study (Appendix 1). Those sites with limited information available at the time of writing have automatically been included in Category 3.

The sites are listed in alphabetical and numerical order by their RMP Number.

RMP No.	Townland	Item	Status	CATEGORY
KK042-002(01-04)	GRANGE	ECCLESIASTICAL REMAINS	LISTED IN CO. KILKENNY DEVELOPMENT PLAN	2
KK042-003	GRANGE	TOWER HOUSE		2
KK042-004(01-03)	KILCRAGGAN	TOWER HOUSE AND DWELLINGS		2
KK042-006(01-02)	CLONMORE	ECCLESIASTICAL REMAINS		2
KK042-007	CLONMORE	HOLY WELL	LISTED IN CO. KILKENNY DEVELOPMENT PLAN	3
KK042-008	CLONMORE	MANSION		2
KK042-009	BALLYTARSNEY	ENCLOSURE		3
KK042-010(01-02)	BALLYTARSNEY	ECCLESIASTICAL REMAINS		2
KK042-011(01-05)	POLLRONE	ECCLESIASTICAL REMAINS	LISTED IN CO. KILKENNY DEVELOPMENT PLAN	2
KK042-012	WADDINGSTOWN	HOLY WELL		3
KK042-013(01-03)	RATHKIERAN	ECCLESIASTICAL REMAINS	LISTED IN CO. KILKENNY DEVELOPMENT PLAN	2
KK042-014	RATHKIERAN	FULACHT FIADH		3
KK042-015	BALLINLOUGH	FULACHT FIADH		3
KK042-0016 (01-02)	AGLISH SOUTH	ECCLESIASTICAL REMAINS		2
KKO42-017	PORTNASCULLY	MOTTE AND BAILEY		2
KKO42-018(01-02)	PORTNASCULLY	ECCLESIASTICAL REMAINS		2
KK042-035	PORTNASCULLY	HOLY WELL		3
KK049-049	KILCRAGGAN	RINGFORT		3
KK042-50	RATHCURBY SOUTH	MEGALITHIC		3

		STRUCTURE		
KK042-051	WADDINGSTOWN	SOUTERRAIN		3
KK043-022(01-02)	DUNGOOLY	ENCLOSURE (SITE)		3
KK043-023(01-02)	AGLISH NORTH	FULACHTA FIADH (SITE)		3
KK043-024	AGLISH NORTH	FULACHT FIADH (SITE)		3
KK043-025	CURRAGHMARTIN	FULACHT FIADH (SITE)		3
KK043-026(01-02)	CURRAGHMARTIN	FULACHT FIADH (SITE)		3
KK043-027	BALLYGRIFFIN	FULACHT FIADH (SITE)		3
KK043-028	GRANNY	FULACHT FIADH		3
KK043-029	GRANNY	FULACHTA FIADH (SITE)		3
KK043-030	BALLYGRIFFIN	FULACHT FIADH (SITE)		3
KK043-031	GRANNY	FULACHT FIADH (SITE)		3
KK043-032(01-02)	BALLYGRIFFIN	FULACHT FIADH		3
KK043-033	GRANNY	FULACHT FIADH		3
KK043-034(01-02)	GRANNY	CASTLE AND DWELLING	NATIONAL MONUMENT & LISTED IN CO. KILKENNY DEVELOPMENT PLAN	1
KK045-001	PORTNASCULLY	MOTTE AND BAILEY	LISTED IN CO. KILKENNY DEVELOPMENT PLAN UNDER LISTING ORDER/REGULATIONS	2
KK045-002(01-03)	PORTNASCULLY	ECCLESIASTICAL REMAINS	LISTED IN CO. KILKENNY DEVELOPMENT PLAN	2
KK045-008	LUFFANY	FULACHT FIADH		3
KK045-012	LUFFANY	FULACHT FIADH		3

APPENDIX 2A LIST OF ECOLOGICAL SITES

SITE DESCRIPTIONS

Lower River Suir (Status: SAC)

The designation includes tidal stretches of the River Suir, a number of tidal tributaries and a relatively long freshwater stretch of the Clodiagh River. The site consists of a number of Annex I habitats including:

- Alluvial forest - the best example of this habitat type is located on Fiddown Island. The canopy is dominated by willow species including white willow (*Salix alba*), goat willow (*S. cinerea*) and osier (*S. viminalis*) with a rich ground flora comprised of species typical of alluvial forest including yellow iris (*Iris psuedocorus*), wild angelica (*Angelica sylvestris*), pendula sedge (*Carex pendula*) and meadowsweet (*Fillipendula ulmaria*). These forests also support a rich bruophyte and lichen flora.
- Old oak woodlands - the canopy of these woodlands is dominated by pedunculate oak (*Quercus robur*) and have an extensive species list throughout including bryophytes and lichens. A rare lichen of particular note found here is *Lobaria pulmonaria*.
- Floating river fauna in the freshwater stretches - typical species include *Myriophllum sp., Potamogeton pectinalis, P. crispus, P. perfoliatus, Ranunculus sp*.

A number of Annex II species are also found within the SAC including:

- freshwater pearl mussels(*Margaritifera margantifera* and *M. m. durovensis*)
- freshwater crayfish (*Austropotamobius pallipes*)
- Salmon (*Salmo salar*)
- Twaite shad (*Alos fallax fallax*)
- 3 species of lampreys - sea lamprey (), brook lamprey () and river lamprey()
- otter (*Lutra lutra*).

Fiddown Island (Status: NHA)

A lowlying river island completely covered with reed swamp and willow. An interesting variety of willow species and their various hybrids occur here.

River Suir below Carrick on Suir (Status: NHA)

The site includes the Coolfin Marshes, which support nationally important numbers of overwintering greylag geese. It is also notable for whooper swan, teal, tufted duck, golden

plover, lapwing and curlew. The site is bordered by rivers Clodiagh, Darrigal, Pouldrew, Blackwater, and the Suir.

Tibberaghny Marshes (Status: NHA)

An area of swamp marshes and wet fields beside the Suir river. It is important for wintering duck, particularly teal, mallard and wigeon. Greylag geese occasionally occur.

APPENDIX 2B: ALLOCATION OF SCORES FOR EACH CRITERIA

Table 2B.a: Allocation of scores based on size criteria

Habitat	1	2	3
Unimproved/semi-improved grassland	<0.5Ha	0.5-2.5Ha	>2.5Ha
Broad-leaved woodland	<1Ha	1.0-2.5Ha	>2.5Ha
Green Lanes	No adequate criteria, given score of 2		
Open Water (standing)	<50m2	50-150m2	150m2
Watercourses	No adequate criteria, given score of 2		
Scattered Scrub	<0.5Ha	0.5-2.5Ha	>2.5Ha
Semi-natural Bog	<0.5Ha	0.5-2.5Ha	>2.5Ha
Coniferous Woodland	<1Ha	1.0-2.5Ha	>2.5Ha

Table 2B.b: Allocation of scores based on re-creatability criteria

	Not re-creatable	Re-creatable given sufficient resources	Readily re-creatable
Natural	10	7	1
Semi-Natural	5	5	1
Artificial	N /A	1	1

Table 2B.c: Allocation of scores based on rarity criteria

CRITERIA	SCORE
Known presence of Internationally or nationally rare habitat or species	10
No known presence of Internationally rare habitat or species	0

Table 2B.d: Allocation of scores based on fragility criteria

CRITERIA	SCORE
Insensitive	1
Moderate sensitivity	2
High sensitivity	3

Overall Ranking

The scores from the above criteria were added together to provide an overall total score for each individual area of habitat. The sites were then divided into 4 categories of low value (score<6), medium value (score <10), high value (score <20) and very high value (score >19) which corresponds to the level of ecological constraint they represented relative to each other.

HABITAT SCORES

The following scores have been attributed to the two habitat areas recorded outside the statutory designations:

Habitat area	Size	Rarity	Fragility	Recreatability	Overall score	Level of ecological constraint
Quarry	3	0	1	1	5	Low
Railway line	2	0	1	1	4	Low

The following table defines the importance of the sites within each of the five categories identified in the report.

Level of constraint	Site value
Very high	International or National importance
High	Regional importance
Medium	High local importance
Low	Moderate to low local importance

Appendix 3 - Landscape and Visual Sites

The following sites within the Study area have been listed in the Draft County Development Plan, 2000, of Kilkenny County Council.

National Monuments Protected by the State under the Monuments Acts, 1930,1954 (Amended 1987)

Grannagh Granagh Castle

Monuments to be protected by Listing Orders / Registration

Portnascully Motte and Bailey

Record of Protected Structure

Buildings, structures and features of historic, architectural and artistic importance, the protection and preservation of which is an objective of the planning authority. It is an objective of the Planning Authority to seek the preservation of the following listed buildings by reason of their artistic, architectural or historical interest.

Key: I: International, N: National, R: Regional, L: Local importance

List B *Catholic Churches*

Mooncoin dated 1869 - single cell

Rating I Location: Mooncoin village, Map Reference 23.S.50.16

List D *Vernacular Houses*

Licketstown/Mooncoin area - thatched farm cluster

Rating I Map Reference: 23.S.54.12

Mooncoin area - Traditional; homesteads in loop of Suir

List E *Tower Houses*

Grannagh a later 14th Century tower-house with later work including a 17th Century oriel window and partial restoration in the 18th Century. Beside the tower is a medieval two-storeyed hall, and the whole is surrounded by a curtain wall. It is now a National Monument.

Rating: I Location: (Granny) 2 miles W of Waterford. Map Reference: 23.S.57.14

Industrial Archaeology

Grade 4

Granny Limestone Quarry Extensive remains of abandoned deep workings

Proposed National Heritage Areas (NHAs) and Proposed Special Areas of Conservation (SACs)

National Importance:

Map. Ref. 399

Name: Lower River Suir Coolfin, Portlaw

Local Importance:

Map Ref. 833

Name: Granny Ferry.

Note: Map References relate to map no. 9.1 accompanying the Kilkenny Draft County Development Plan 2000.

Areas of High Amenity in County Kilkenny

10. Area bounded to north by N24 and to the south, south east by the River Suir.

Views to be preserved and protected

Ref. A21 Views south-west over the River Suir at Grannagh Castle to the Comeraghs.