Ireland West Airport Knock Strategic Development Zone

DRAFT Planning Scheme 2019

Strategic Environmental Assessment

Environmental Assessment

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Section 1: SEA Introduction & Context

1.1 Introduction

Mayo County Council has prepared a draft Strategic Development Zone for Ireland West Airport Knock, namely the Draft Planning Scheme for Ireland West Airport Knock Strategic Development Zone in accordance with Pat IX of the Planning and Development Act 2000-2010 and the Planning and Development (Strategic Environmental Assessment Regulations 2004-2011.

This is the Environmental Report (ER) on the Strategic Environmental Assessment (SEA) of the draft Planning Scheme. The purpose of the ER is to identify, evaluate and describe the likely significant effects on the environment of implementing the draft Planning Scheme. The SEA facilitates interested parties to comment on the environmental issues associated with the plan. The report identifies the significant environmental effects of the plan on the environment and where significant effects are identified, recommends appropriate mitigation measures to avoid or reduce such effects. The preparation of the ER has been integrated into and informed the preparation of the draft Planning Scheme. Accordingly, it should be read in conjunction with the draft Planning Scheme.

The Draft Strategic Development Zone supersedes the Local Area Plan (LAP) for IWAK was prepared in accordance with Sections 18 – 20 of the Planning and Development Acts 2000 – 2010. It is the first statutory land use plan that has been made for Ireland West Airport Knock (IWAK). The Local Area Plan 2012-2018 was adopted by Mayo County Council in October 2012. The lifespan of the LAP was subsequently extended until June 2022 to ensure that the development objectives of the LAP remain in place until such time as the SDZ Planning Scheme is adopted.

Figure 1 Planning Scheme Boundary

1.2 Scale, nature and development of the Planning Scheme

Ireland West Airport Knock was designated as a Strategic Development Zone by the Government of Ireland on the 30 May 2017 under SI 266 of 2017 which states the Ireland West Airport Knock Planning Scheme may principally include:

"(a) commercial activities including the development of infrastructure to support aviation including air cargo logistics facilities, aircraft hangars, maintenance and repair facilities, and airline and flight services,

(b) the provision of hotel and conference facilities,

(c) the development of any commercial or employment activity that, in the opinion of the first local authority having regard to the proper planning and sustainable development of its local authority area, requires to be located within the strategic development zone and cannot be reasonably accommodated at any other location in either the local authority area of the first local authority situated outside of the strategic development zone or the local authority area of any of the other local authorities in the Northern and Western Regional Assembly Area, and

(d) the provision of supporting transport infrastructure."

A Draft Planning Scheme consists of a written statement and a plan indicating the manner in which a site to which the scheme relates is to be developed, including:

- The types of development which may be permitted to establish on the site.
- The extent of any such proposed development.
- Overall design criteria proposals including maximum heights, the external finishes of structures and their general appearance and design.
- Transportation proposals including public transportation, the roads layout, the provision of parking spaces and traffic management.
- Service provision proposals including the provision of waste and sewerage facilities and water, electricity and telecommunications services, oil and gas pipeline.
- Proposals relating to minimising any adverse effects on the environment including the natural and built environment and on amenities of the area,

The Planning Scheme is made either by elected members of the Planning Authority or after an appeal process to An Bord Pleanála. Development within a Planning Scheme requires planning permission and has to be granted permission where the proposed development is consistent with the Planning Scheme. There is no appeal procedure on an application for development within a Planning Scheme.

At a strategic level the development of the SDZ lands will deliver a place for employment to be based.

1.3 Legislative Context

The Directive on Strategic Environmental Assessment cane into effect in July 2001(EU SEA Directive 2001/42/EC), requiring each of the Member States to assess the likely significant environmental effects of plans and programmes prior to their adoption. All land use plans in Ireland are subject to SEA procedures and environmental considerations must be assessed at an early stage in the decision-making process.

This Directive was transposed into Irish law in 2004 under two sets of regulations, which were both amended in 2011.

- The European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2011 (S.I. No 200 of 2011)
- Planning and Development (Strategic Environmental Assessment) (Amendment) Regulations 2011, (S.I. No. 436 of 2004).

The legislation requires mandatory Strategic Environmental Assessment as part of the preparation of a Planning Scheme for a Strategic Development Zone.

1.4 Strategic Environmental Assessment (SEA)

SEA is the systematic, ongoing process of evaluation of the likely significant environmental effects of implementing a plan or programme in order to ensure that these effects are appropriately addressed before a decision is made to adopt it. The overall aim of SEA is to:

- provide a high level of protection of the environment
- integrate environmental considerations into the preparation of Planning Scheme from the outset
- increase public participation in environmental decision making
- improve the environmental sustainability of the Planning Scheme
- raise awareness of the potential environmental consequences of its implementation so that these consequences may be mitigated or avoided altogether

This ER records the process and findings of the SEA and its preparation is also part of the SEA process.

1.5 Contents of the Environmental Report

The Environmental Report is required to contain information as set out in Schedule 2 of the EC (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (S.I. No. 436 of 2004) as amended. Table 1.1 outlines the information that is required and the relevant sections of this ER in which the information is located.

Table 1 Information required to be in Environmental Report

Schedule 2B Instrument 436 of 2004	***Chapters each are addressed in this SEA ER***
(a) An outline of the contents and main objectives of the plan and relationship with other relevant plans	Chapter One- Introduction and Chapter Two- Methodology outlining contents and main objectives, Chapter Three details the relationship with other relevant plans.
(b) The relevant aspects of the current state of the environment and the likely evolution thereof without the implementation of the plan	Chapter Four- The Baseline Environment details this information.
(c) Any existing problems characteristics of areas likely to be significantly affected	Chapter Four- The Baseline Environment details this information.
(d) Any existing environmental problems which are relevant to the plan including, in particular,	Chapter Four- The Baseline Environment details this information.

environmental importance, such as areas designated pursuant to the Birds Directive or Habitats Directive	
(e) The environmental protection objectives, established at international, European Union or national level, which are relevant to the plan and the way those objectives and any environmental considerations have been taken into account during its preparation	Chapter Five- SEA Objectives provides this information.
(f) The likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors	Chapter Seven- Significant Effects on the environment provides this information.
(g) The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan	Chapter Eight- Mitigation Measures provide this information.
(h) An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies) encountered when compiling the required information	Chapter Six- Alternatives considered provides this information and difficulties encountered are listed at the end of Chapter Two, The Baseline Environment.
(i) A description of the measures envisaged concerning monitoring of the significant environmental effects of implementation of the plan	Chapter Nine- Monitoring provides this information.
(j) A non-technical summary of the information provided under the above headings	This is provided in a separate document.

Section 2: SEA Methodology

2.1 Introduction

The methodology used in the SEA of the draft Planning Scheme complies with the requirements of EU Directive 2001/42/EC as transposed into Irish law by the EC (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (S.I. No.435 of 2004) and the Planning and Development (SEA Regulations) 2004 (S.I. No. 435 of 2004). This methodology also reflects national guidance relating to SEA including the following documents:

- Implementation of SEA Directive (2001/42/EC) Assessment of the Effects of Certain Plans and Programmes on the Environment – Guidelines for Regional Authorities and Planning Authorities" DoEHLG 2004
- Development of Strategic Environmental Assessment (SEA) Methodologies for Plans and Programmes in Ireland – Synthesis Report, EPA 2003
- SEA Process Checklist Consultation Draft 2008 EPA 2008
- Strategic Environmental Assessment (SEA) And Climate Change: Guidance for Practitioners (EPA 2004)
- SEA Pack and Scoping Guidance Document, EPA Updated Version 2010
- Strategic Environmental Assessment (SEA) SEA Process Checklist EPA Consultation Draft Document January 2008

2.2 Stages in the SEA Process

There are 4 main stages involved in the SEA Process:

1. Screening
2. Scoping
3. Identification, Prediction, Evaluation and Mitigation of Potential Impacts
4. Consultation, Revision and Post Adoption Activities (monitoring)

2.2.1 Screening

Where SEA is mandatory for certain plans while screening for SEA is required for other plans that fall below the specified thresholds. A Strategic Environmental Assessment is required for all SDZ planning schemes; to comply with EU SEA Directive 2001/42/EC. This Directive was transposed into Irish law through the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations (S.I. No 435 of 2004) and the Planning and Development (SEA) Regulations (S.I. No. 436 of 2004). Therefore, the Planning Scheme has progressed to the next stage in the SEA- Scoping. A review is provided below.

2.2.2 Scoping

The purpose of the SEA Scoping Report is to identify the scope of the SEA to ensure that all relevant data and environmental topics are included in the SEA. Mayo County Council carried out a scoping exercise in conjunction with the prescribed Environmental Authorities[1] to establish the scope and level of detail to be included in the ER and to identify environmental issues which would require further consideration during the SEA process. In this regard, a scoping consultation document was submitted to the Environmental Authorities on the 12 October 2018. The document gave an outline of the

[1] Environmental Protection Agency; Department of Environment, Heritage and Local Government; Department of Communications, the Marine and Natural Resources.

geographic area involved; the nature of the Planning Scheme the likely scale, nature and location of development within the Planning Scheme area and predicted significant environmental impacts. The Environmental Authorities were invited to make written submissions on the scope and level of detail of the information to be included in the ER. Submissions were received from the Environmental Authorities and are summarised in Table 2.

Table 2 Summary of Scoping Submissions Received

Consultee	Key Issue Raised
Environmental Protection Agency (EPA)	A SEA Pack and SEA Scoping Guidance Document were submitted to assist with the undertaking of the SEA. The Strategic Flood Risk Assessment needs to consider the impact of any extreme weather events and the likelihood of flooding within the masterplan area or elsewhere. Any assessment of flooding should be expanded to other extreme weather periods of drought, higher intensity rainfall and associated increased runoff, lightning strikes, freeze-thaw scenarios. The Planning Scheme should be informed by the Draft County Mayo Noise Action Plan 2018-2023.
Inland Fisheries Ireland (IFI)	Considerations should be given to the Waste Water Treatment Plant to the capacity available in the receiving waters for parameters including ammonia and phosphorus must be carried out to identify the impact of any future development in this area. The IFI noted that Under the objective of conservation and protection of the environment, it should include a riparian buffer zones along the watercourses within the area. IFI states there should be measures put in place to ensure there is no spread of any invasive species. He Bio-security Protocol should be considered IFI states that it is a requirement for each development in incorporate SUDS for the treatment of surface water and alleviation and pollution prevention.
Department of Culture, Heritage and the Gaeltacht	Land falls substantially within the Moy Catchment and also extends into the Shannon Catchment to the East. Peatlands are predominant throughout the site with other wetlands present namely Molinia Meadows and Wet Woodland Quarries within the plan area will have commitments in relation to after-use and restoration which are likely to be of long-term benefit for biodiversity. A 'constraints study' approach is recommended as the basis for producing the masterplan and for informed decision making in relation to land-use zoning and environmental protection. By doing this significant effect on the environment including biodiversity and natural heritage can be avoided by necessary mitigation to reduce or offset adverse effects. Map of the habitat and wetlands should be produced

	The monitoring programme should be set out clearly and developed in a manner to ensure it will identify the effects on the environment that will or may arise and monitor the effectiveness of any mitigation on which assessment relies. Consideration should be given to the changes to Article 6 of the Habitats Directive. The stages and tests of the Appropriate Assessment proves should follow legislation that applies now.
Department of Communications, Climate Action and Environment- Geological Survey Ireland	County Geological Sites include additional sites that maybe of national importance but were not selected as the best examples for NHA designation. There is a CSG within the vicinity of IWAK – Knock Airport Road Cutting

2.3 Establishing the Environmental Baseline

Before future environmental impacts can be predicted, it is necessary to achieve an understanding of the current state of the environment. Therefore, a baseline description of the current physical environment must be established, with particular reference to those aspects of the environment which are experiencing existing environmental problems or are likely to be significantly affected by implementation of the Planning Scheme. Such baseline data is required to:

- allow environmental problems to be identified
- provide a baseline against which future monitoring can be carried out and
- provide a basis for impact prediction.

Baseline data relating to the environmental parameters identified in the SEA Regulations was collected from a variety of existing known environmental and other relevant data sources, including from within the Council in order to establish the current state of the environment.

2.4 Consideration of Alternatives

Article 5 of the SEA Directive requires the Environmental Report to assess the likely significant environmental effects of implementing a plan and "reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme". Three alternative development scenarios were considered. These are discussed and evaluated in Section 6. The Three alternatives are:

- The Do-Nothing Scenario
- Alternative Scenario 1- Urban Style Layout
- Alternative Scenario 2- Green Campus (Planning Scheme Option)

The alternatives were considered reasonable, realistic, capable of implementation and set at the appropriate level at which the Planning Scheme will be implemented operating within the planning hierarchy i.e. the higher the level of the plan the more strategic the options which are available.

2.5 The Environmental Report

The Environmental Report (ER) sets out the findings and results of the SEA process on the likely significant effects of implementing the draft SDZ Planning Scheme for IWAK. It also sets out mitigation measures to prevent or reduce significant adverse effects likely to arise from implementation of the draft Planning Scheme, together with alternatives considered and measures relating to monitoring following its adoption.

Assessment of the Impact of the Planning Scheme on the Environment

In accordance with the SEA Directive, the likely significant effects on the environment of implementing the Planning Scheme must be assessed. In line with best practice, as set out in the SEA guidelines, the planning team as a whole carried out the assessment of the likely significant effects of the plan by testing the vision, the objectives, contained within Planning Scheme against the environmental protection objectives devised by the SEA team. Policies and objectives were determined to have either: positive impact, very positive impact, insignificant/no impact, negative, very negative, or uncertain impact on the environmental receptors. Section 7 of this report contains the findings of the detailed evaluation of the preferred alternative against the Environmental Protection Objectives.

Mitigation

Annex I of the SEA Directive requires the Environmental Report to include measures envisaged to prevent, reduce and as fully as possible offset any significant adverse impacts on the environment of implementing the plan. These measures are referred to as “mitigation” measures. Mitigation measures include proactive avoidance of adverse effects on the environment as well as actions taken after any negative effects are noticed. Section 8 of this report describes the measures devised to mitigate against any potential significant impacts of implementing the Planning Scheme for the SDZ.

Monitoring

The significant environmental effects of the implementation of the Planning Scheme must be monitored in order to identify at an early stage unforeseen adverse effects and to allow for appropriate remedial action to be undertaken. A monitoring programme has been devised having regard to the existing monitoring mechanisms currently in place in Mayo County Council. Section 9 of this report sets out the Monitoring Programme.

2.6 The SEA Statement

After the Planning Scheme is made, Mayo County Council will prepare and make available for inspection an Environmental Statement which will include:

- a summary of how environmental considerations have been integrated into the
- Planning Scheme
- how the ER, submissions and consultations have been taken into account
- the reasons for choosing the Planning Scheme as adopted over other alternatives dealt with

- measures to monitor the significant environmental effects of implementation of the Strategic Development Zone.

2.7 Difficulties Encountered in Compiling the Required Information

There were a number of areas where there was insufficient data available or where the level of detail was inadequate for the purpose of establishing baseline data. Details of difficulties encountered are detailed in respect to the various environmental components set out below:

2.7.1Biodiversity, Flora and Fauna

The principal problems in relation to baseline data include the lack of detailed information on the habitats and species of the area. Detailed habitat mapping was not available for the SEA study area, but information contained in an EIS prepared for the Airport Authority as part of a planning proposal was used in this regard. There is a need to identify and collect information on all areas of local biodiversity value and ecological corridors in this area and also in the wider county. Baseline information on the location and condition of habitats is fundamentally important for habitat management and conservation. This information is necessary to inform future planning policy and conservation policies, and for creating awareness among the public. Habitats of high conservation value can be avoided when planning developments and can be targeted for biodiversity conservation or enhancement measures.

2.7.2 Population and Human Health

Population figures are extracted from the 2016 Census, identifying a population of 130,507 for County Mayo. The census results show that the population in County Mayo that there was a slight decrease of 0.17% in population between 2011 and 2016.

2.7.3 Soil and Geology

Information relating to soils and geology is available for the area. No significant difficulties were encountered.

2.7.4 Water

Specific challenges encountered in sourcing the information related to the large volume of local, national and international material. In particular, the Western River Basin Management Plan 2009 to 2014 and the second cycle running from 2015-2021, along with associated Programmes of Measures (PoM) contain extremely informative data, but this information is modified and updated regularly. Mapping data provided from the WRBD to Mayo County Council varied subtly from that on the WRBD website, resulting in occasional differing water body borders and delineations. WFD datasets are not yet finalised for Mayo (some water bodies are currently not classified), so that water body status data used in producing this report are drafts and may still be subject to change.

2.7.5 Air and Climate Factors

There is no data available to accurately describe potential air pollution hotspots without the need for monitoring and compiling the information specifically for the area. Specific baseline data on greenhouse gasses has not been conducted for Mayo, so national data is used for this report.

2.7.6 Material Assets

In relation to roads, there are no traffic counts available along the local roads that lead to the airport, therefore there is no baseline data to determine impact of traffic movements along these roads. There is also a lack of data relating to location, quality and quantity of private drinking water sources in the area.

2.7.7 Cultural Heritage

No detailed survey work has been carried out in the area to determine if any building or structure is of architectural interest.

2.7.9 Landscape

Currently there is no accurate contour survey of the existing lands within the Planning Scheme area and beyond.

2.8 Co-Ordination of the SEA Process

An inter-departmental multi-disciplinary SEA Team was established within the Council incorporating a broad range of expertise to ensure relevant environmental issues were identified and addressed. This group consisted of representatives from Water Services; Environment; Planning; Roads; Regional Design Office; and GIS and other sections with expertise relating to the built and natural heritage. Meetings were held at key stages of the process and the SEA team participated in establishing baseline data; identifying significant environmental issues and environmental protection objectives, targets and indicators; consideration of alternatives and the assessment of the policies and objectives in the draft Planning Scheme; identification of mitigation measures and monitoring. The Forward Planning Section co-ordinated the SEA process and compiled the Environmental Report.

Section 3: Relationship with other relevant plans and programmes

3.1 Introduction

During the preparation and implementation of the Planning Scheme the relationship between the Planning Scheme and other relevant plans and programmes must be taken into account.

The SDZ Planning Scheme must be considered within the context of a hierarchy of policies, plans and strategies which include international, national, regional and local level policy documents. These documents set the policy framework within which the plan will operate. The Mayo County Development 2014-2020 operates as the primary land use framework for the County and the Planning Scheme has equal status to the County Development Plan. The Draft Planning Scheme has been prepared having regard to the policies and objectives outlined within the Mayo County Development Plan 2014-2020. The key environmental protective objectives and policies of the Planning Scheme are consistent with the County Development Plan.

In accordance with SEA legislation this Environmental Report includes information that may reasonably be required taking into account a number of factors, one of which is the extent to which certain matters are more appropriately assessed at Strategic Development Zone level in order to avoid duplication of environmental assessment.

3.2 National Guidance

There are a number of relevant National Planning Guidelines which have guided the strategy and objectives set out in this Strategic Development Zone, Planning Scheme. These include, but are not limited to, the following:

- Architectural Heritage Protection Guidelines - Guidelines for Planning Authorities.
- Implementing Regional Planning Guidelines - best practice guidelines (2005)
- Landscape and Landscape Assessment (2000)
- Development Plans Guidelines -June 2007
- Retail Planning Guidelines
- Implementation of Strategic Environmental Assessment Directive: Assessment of the Effects of Certain Plans and Programmes on the Environment. (2004)
- Appropriate assessment of Plans and Projects in Ireland: Guidance for Planning Authorities (2009)
- The Planning System and Flood Risk Management - Guidelines for Local Authorities (Nov 09)

3.2.1 The National Planning Framework 2040 (NPF)

The National Planning Framework 2040 sets out Irelands overall approach to national spatial planning. Its aim is to promote balanced regional growth in Ireland and to promote high quality connectivity through ports and airports. The NPF identifies Mayo as having several strong centres which are focused on employment and services, all which can accommodate greater populations and job growth. Furthermore, Mayo is a part of a group of counties identified in the NPF as having an integral part of the state's heritage and a special significance to Irish culture.

"Ireland West-Knock Airport and a strengthening of the urban and employment structure of the wider North-Western region, will provide new opportunities, to be complemented by enhanced east-west accessibility" (P.40)

"Ireland West-Knock Airport has a significant role in tourism and enterprise development, with potential for further growth taking particular account of its designation as a Strategic Development Zone (SDZ)." (P.40)

3.3 Legislative Context

A Planning Scheme is made under the Planning & Development Act (as amended) and a number of Regulations including the Local Government (Planning & Development) Regulations and Planning & Development (SEA) Regulations. In addition to the above strategic policy framework documents, the SDZ and SEA have had regard to the following environmental legislation:

The Wildlife Act, 1976 and the Wildlife Amendment Act, 2000
EU Birds Directive (79/409/EEC) Council Directive 79/409/EEC
EU Habitats Directive (92.43/EEC)
The Flora (Protection) Order 1999
UN Convention of Biological Diversity 1992 (ratified 1996)
Convention on Wetlands of International Importance (Ramsar Convention 1971)
The Local Government Water Pollution Acts 1977 as amended
Water Services Act 2007
The Directive 2000/60/EC establishing a framework for Community action in the field of water policy (also known as the Water Framework Directive)
S.I. No. 9 of 2010 – European Communities Environmental Objectives (Groundwater) Regulations 2010
European Communities (Water Policy) Regulations, 2003
European Communities Environmental Objectives (Surface Waters) Regulations, 2009
European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations, 2009
European Communities (Quality of Salmonid Waters) Regulations, 1988
Urban Waste Water Treatment Regulations, 2001
Waste Water Discharge (Authorisation) Regulations, 2007
Air Pollution Act 1987 as amended.
The Environment Protection Agency Act 1992 (Ambient Air Quality Assessment and Management) Regulations 1999 and the Air Quality Standards Regulations 2002
Protection of the Environment Act 2003
Waste water discharge (Authorisation) Regulations 2007
Dangerous Substances Regulations (S.I. No. 12 of 2001)
Environmental Protection Agency Act 1992
Environmental Noise Regulations 2006
The Waste Management (Amendment) Act, 2000
Waste Management (Collection Permits) Regulations S.I.820 of 2007
Waste Management (Collection Permits) Amendment Regulations S.I. no. 87 of 2008
Waste Management (Facility Permit & Registration) Regulations 2007
Waste Management (Facility Permit & Registration) (Amendment) Regulations 2008
Waste Management (Movement of Hazardous Waste Regulations 1998 -2000
Waste Management (Prohibition of Waste Disposal by Burning) Regulations 2009
The European Directive on the Assessment and Management of Flood Risks (2007/60/EC of 23 October 2007) (The Floods Directive)

EIA Directive (85/337/EEC as amended by 97/11/EC and 2003/35/EC) EIA Directive (85/337/EEC as amended by 97/11/EC and 2003/35/EC)
The Heritage Act 1995
European Convention on Protection of the Archaeological Heritage 1992 (Also known as the Valletta Convention)
Convention for the Protection of the Architectural Heritage of Europe (Granada Convention), European Treaty Series no.121, 1985
The Venice Charter 1964
The Washington Charter 1987
The Burra Charter 1979/ 1981/ 1988
The Nara Document on Authenticity 1994
The European Landscape Convention
Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999
National Cultural Institutions Act 1997
The National Monuments Acts 1930 to 2004
The Kyoto Protocol Flexible Mechanisms Regulations 2006 (S.I. 244 of 2006)
Emissions Trading Directive (2003/87/EC)
SI 437 of 2004: European Communities (Greenhouse gas emissions Trading) Regulations 2004
SI 706 of 2005: European Communities (Greenhouse gas emissions Trading) Amendment Regulations 2005

3.4 Regional and County Guidance

3.4.1 Draft Regional Spatial and Economic Strategy for the Northern and Western Regional Assembly

The Regional Spatial and Economic strategy sets out a framework to support the implementation of the National Planning Framework and the economic policies and objectives of the government by providing a long-term strategic planning and economic framework for the development of the regions.

The RSES details the significant role Ireland West Airport Knock plays on the region as it acts as an economic driver for the region and has a major impact on the region.

Furthermore, the Strategic Development Zone at IWAK represents a shared outlook for the future economic development of the both County Mayo and the West/North West region and represents a significant gamechanger for the region and the Atlantic Economic Corridor.

The SDZ will play an important role in the delivery and implementation of higher-level infrastructure for the area. It will provide a high-quality design approach at IWAK ensuring the design response delivers a distinct identity which in turn will create an international profile.

3.4.2 Regional Planning Guidelines for the West Region 2010-2022

The Regional Planning Guidelines for the West Region are to be replaced by the RSES imminently.

The Regional Planning Guidelines for the West Region 2010 – 2022 (RPG's) set out a framework for the long-term strategic development of counties Mayo, Galway and Roscommon (West Region). The Guidelines aim to deliver balanced regional development in the Region with specific objectives to stimulate social, economic and cultural development.

Specifically, in relation to Ireland West Airport Knock the guidelines outline a strategic role for Ireland West Airport Knock in the following terms:

The strategic importance of Ireland West Airport Knock as an amenity and an important transportation link to facilitate the growth and connectivity to the West Region
To develop hubs for industry and commerce adjacent to or in the region around the airport
To facilitate the appropriate and sustainable development of industrial/commercial lands and structures adjacent or close to the airport.

3.4.3 Mayo County Development Plan 2014-2020

The Mayo County Development Plan was adopted in 2014 and sets out a policy framework for development within the County until 2020. The Plan sets out a long-term vision for the County to develop by employing the principles of sustainable development and social partnership. A central component of the Core Strategy is the County Settlement Strategy based on a settlement hierarchy which is consistent with the spatial structure, aims and objectives of the NSS and RPGs. The development of the strategic role of Ireland West Airport Knock as a driver of economic development supports the aims, policies and objective of the Mayo County Development Plan 2008-2014.

A review of the Mayo County Development Plan 2014-2020 commenced on 16th April 2018. The review has been postponed until the adoption of the RSES.

The County Development Plan specifically identifies the future growth of Ireland West Airport Knock through the following aims, policies and objectives.

Air Transport

AT-01	It is an objective of the Council to support the development of Ireland West Airport Knock in accordance with the Ireland West Airport Knock Local Area Plan 2012.
AT-02	It is an objective of the Council to request the Minister of the Environment, Community and Local Government to designate the area within the Ireland West Airport Knock Local Area Plan as a Strategic Development Zone.
AT-03	It is an objective of the Council to safeguard public safety in the area around Ireland West Airport Knock by ensuring all development within 15km of Ireland West Airport Knock be subject to safeguarding restrictions outlined in the Development Guidance document of this Plan.
AT-04	It is an objective of the Council to ensure any development associated with light aircraft/helicopter activity is located in areas that avoid significant adverse effects on the environment, the integrity of the Natura 2000 network and residential amenity.
AT-05	It is an objective of the Council to support the implementation of Ireland West Airport Knock Local Area Plan 2012 – 2018 in so far as resources permit.

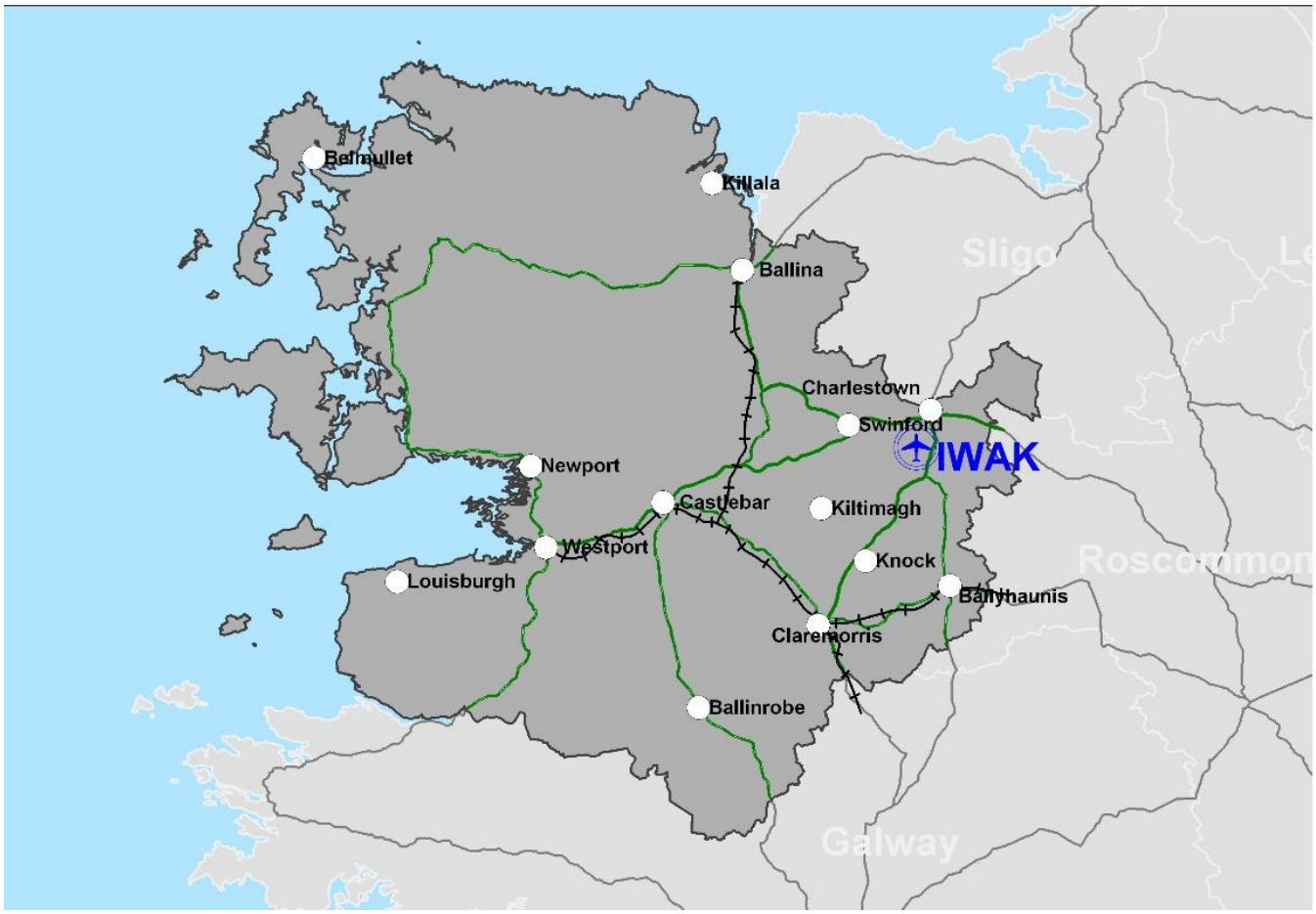
Section 4: Environmental Baseline

4.1 Introduction

Article 5 of the SEA Directive states it is necessary that the environmental report is required to take into account current knowledge and methods of assessment. The baseline information outlines the environmental context within which the Planning Scheme will operate and the opportunities, constraints and targets that this context puts on the Planning Scheme. Current environmental issues likely to be significantly affected by the implementation of the planning scheme are identified at this stage of the process in order to more accurately assess potential future impacts. This section describes the environmental baseline in terms of the following environmental components; biodiversity, flora and fauna; population and human health; soils and geology; water; air quality and climatic factors; material assets; cultural heritage and landscape. This section also describes the interrelationship between these components and the likely evolution of each environmental component without the implementation of the Planning Scheme.

Ireland West International Airport is located in the townland of Kilgarriff West and is centrally located in the Region along the National Primary Route (N17 Galway / Sligo) and 7 km for the National Primary Road (N5) which links Mayo to Dublin. The location is 55km from the Gateway Town of Sligo and 90km from the Gateway town of Galway. Its location is pivotal in the Mayo context as it is 50km from the linked Hub of Ballina / Castlebar.

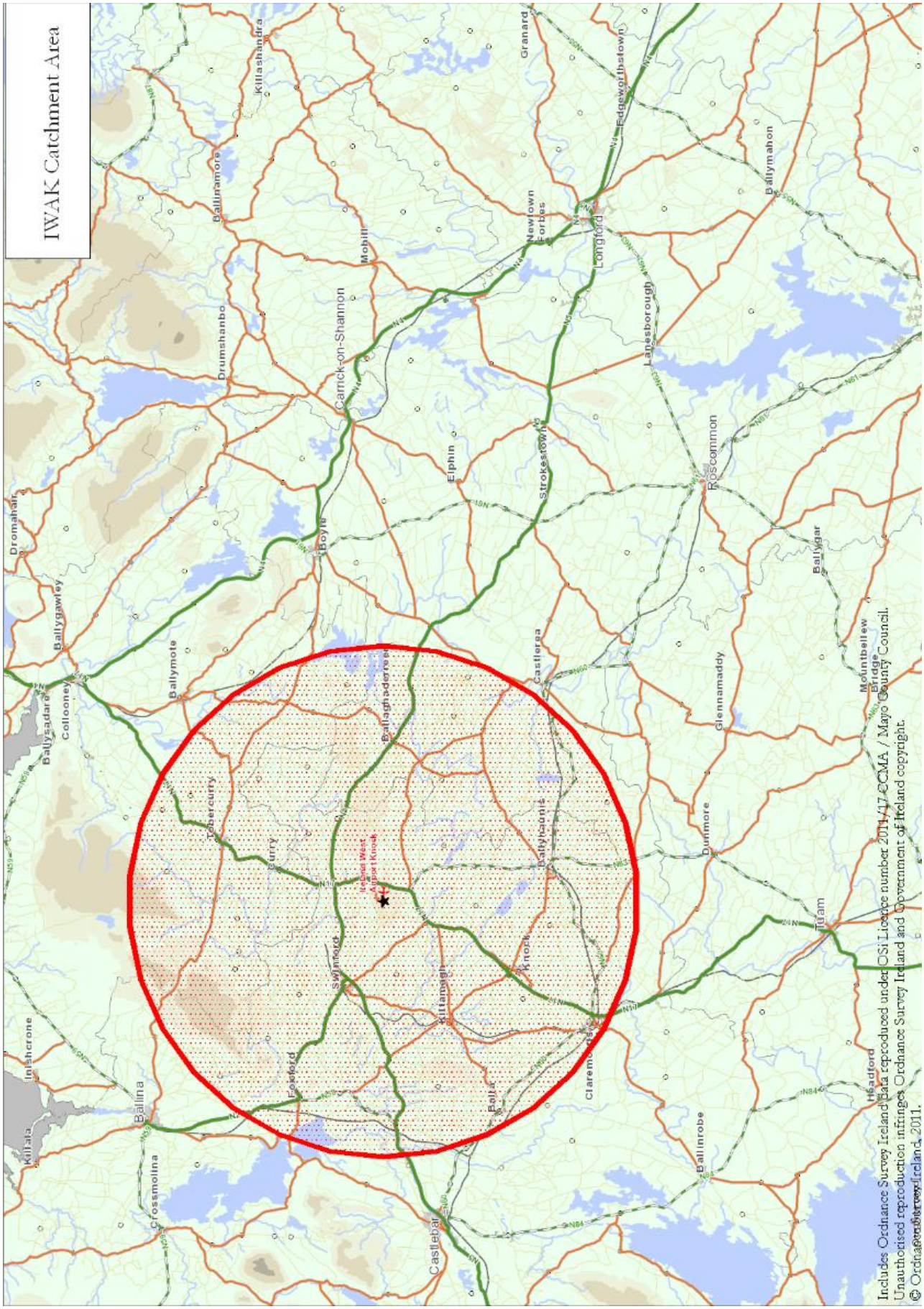
Figure 2 Location of Ireland West Airport Knock



4.2 Population and Human Health

This section provides information on the current population and demographics in the planning scheme and in the surrounding catchment areas. The airport acts as an international gateway to the West of Ireland, North-West and Midlands. IWAK is well positioned within the region to serve a catchment area of close to 1 million people, with large urban areas such as Galway, Athlone and Sligo, located within a two-hour commuting distance from the airport. The provision of a planning scheme at Ireland West Airport Knock will allow for employment growth surrounding the airport.

Figure 3 Catchment Area



4.2.1 Demographic Profile

In order to analyse the demographic profile of the area for the airport, all of the urban areas with a 25 km radius were examined. These include; Charlestown, Swinford, Knock, Kiltimagh, Ballyhaunis, Tubercurry, Ballaghdereen, Castlerea and Claremorris. These towns only represent part of the receiving population as there is a significant rural area within the catchment. However, it is considered that using the data for the town's only would give an overall trend to the demographic profile of the area surrounding the airport.

The airport also draws on the linked hub towns of Castlebar and Ballina and the regionally important towns of Boyle, Strokestown, Roscommon and Carrick on Shannon. In this context of all the towns in the area surrounding the airport and wider area form part of the policy growth areas outlined in the National Planning Framework, Regional Planning Guidelines and County Development Plans.

4.2.2 Population Change

The population of Ireland in 2016 was 4,761,865 persons compared with 4,588,252 persons in 2011, this represents an increase of 3.7%. The population of Mayo in 2016 was 130,507 persons compared with 130,638 persons in 2011. Despite the population growth recorded in the County between 2011 and 2006, Mayo's share of the West Region population continued to decline.

The Regional Planning Guidelines for the West 2010-2022 set out population targets for Mayo of 150,800 for 2022, which would be 29% share of the projected West Regions population.

The population changes for the local catchment area and the wider catchment area are illustrated in Table 3.

Table 3 Population Change

Area	Total Population 2006	2011	% Change	Population 2016	%Change
State	4,239,848	4,588,252	+8.2%	476,1865	+3.7%
Mayo	123,839	130,638	+5.4%	130,507	-0.17%
Local Catchment	22,974	24,606	+7.1%	25,009	+1.6%

Source: Census of Population 2006,2011 and 2016

The population growth rate for the local catchment area is slightly greater that the national rate but for the wider catchment area the growth rate is closer that of the County.

4.2.3 Age Profile

The Age Profile for the State, Mayo and the Catchment Areas are illustrated in Table 4.

Table 4 Age Profile for State, County and Catchment Areas 2016

Area	Age Cohort						
	0-14	15-24	25-44	45-64	65+	Dependent 0-14 & 65+	Working Age 15-64
State	21%	12%	35%	24%	13%	35%	71%
Mayo	7%	11%	25%	27%	18%	25%	63%
Local Catchment Area	20%	40%	26%	25%	19%	39%	61%
Wider Catchment Area	21%	11%	30%	22%	15%	37%	79%

The figures indicate that the dependent age cohort (0-14 and 65+) is lower in the state then in the local catchment area around the airport. The dependent age cohort in the wider catchment area is less that in the local catchment area and is the same as the County. The dependency age cohort is more pronounced in the local catchment area at. The working age population of the local catchment area is lower than the wider catchment area and the County as a whole.

4.2.4 Travel and Distance to Work

The 2016 census of population gives an estimate for travelling to work for each Electoral Division. The airport area includes the Electoral Divisions of Sonnagh, Kilbeagh, Urlar and Kilkelly, which includes the town of Charlestown and the village of Kilkelly.

Table 5 Percentage of working peoples distance travel to work for each of the catchment towns

Area	Time travelling to Work (mins)						
	Under 15 mins	16-29	30 - 44	45- 59	60 - 89	90+	Not Stated
Airport Area	42%	24%	15%	5%	3%	2%	9%
Charlestown	47%	18%	15%	5%	3%	2%	10%
Swinford	49%	20%	14%	4%	3%	2%	8%
Knock	43%	25%	14%	2%	4%	2%	10%
Kiltimagh	48%	23%	12%	3%	4%	3%	7%
Ballyhaunis	55%	20%	7%	2%	4%	2%	10%
Tubercurry	46%	17%	21%	4%	2%	2%	8%
Ballaghadereen	50%	17%	10%	5%	4%	2%	12%
Castlerea	55%	17%	21%	4%	2%	2%	8%

Claremorris	46%	24%	14%	3%	7%	2%	4%
Castlebar	55%	24%	9%	2%	3%	2%	6%
Ballina	55%	22%	7%	3%	3%	1%	7%
Boyle	52%	20%	13%	5%	3%	2%	5%
Strokestown	44%	23%	13%	3%	5%	3%	10%
Roscommon	57%	17%	11%	2%	3%	3%	7%
Carrick on Shannon	48%	20%	11%	4%	4%	3%	10%

Source: Census of Population 2016

4.2.5 Employment

The 2016 Census of Population was examined to determine trends in relation to employment including the number of persons at work and the sectoral composition of the population based upon principal economic status.

Table 6 Employment Levels

Area	Employment Levels (2016)
State	2,006,641
Mayo	51,439
Local Catchment Area	9,189
Wider Catchment Area	13,596

Source: Census of Population 2016

Table 7 Unemployment Figures by Social Welfare Office within catchment areas.

Area	Live Register Figures March 2019
State	192,407
Mayo	6,679
Local Catchment Area	
Swinford	851
Tubercurry	433
Castlerea	971
Claremorris	698
Wider Catchment Area	
Ballina	1,917
Castlebar	1,431
Boyle	477
Roscommon	664
Carrick-on-Shannon	1277

Finally, principle occupations give an indication of the sector that the population of the areas are engaged in. The CSO classifications are as follows:

A = Agriculture, forestry & fishing
B = Building and construction
C = Manufacturing industries
D = Commerce & Trade

E = Transport & Communications
F = Public administration
G = Professional services
H = Other

Table 8 Principle Occupation by Industry

Area	A	B	C	D	E	F	G	H
State	4%	5%	11%	24%	9%	5%	24%	18%
Mayo	9%	6%	14%	20%	4%	6%	23%	18%
Local Catchment	6%	6%	16%	21%	5%	5%	38%	17%
Wider Catchment	1%	4%	13%	25%	4%	7%	25%	22%

Source: Census of Population 2016

On a county level, professional services & commerce workers are the predominant employment category, with manufacturing, building & construction, transport, public administration, and agriculture making up the remaining employment categories. In the local catchment area, it is the commerce/trade & manufacturing workers that are predominant with commerce/trade and professional workers being the predominant employment category in the wider catchment area.

4.2.6 Human Health

Human health has the potential to be impacted by environmental factors including water, soil and air. These factors are examined in greater detail under the relevant environmental topics of this environmental report. In terms of human health, public safety and noise are important considerations in relation to airport activities. Human health may be additionally impacted upon in a variety of ways and by a number of environmental receptors such as water, biodiversity, climate, flooding, air, major accidents and Public Safety Zones (PSZs).

4.2.7 Public Safety Zones

Public Safety Zones (PSZs) are used to protect the public on the ground from the small, but real possibility that an aircraft might crash. Public Safety Zones are used to prevent inappropriate uses of land where the risk to the public is greatest. These zones run parallel to the runway with triangular sections tapering away from the end of the runways. The inner zones are located closest to the runways. The ground area located within these inner zones has the greatest likelihood of an aircraft accident occurring. The likelihood of an accident to occur in the outer public safety zones is less than the inner zones.

A report was prepared for Mayo County Council to established PSZs for Ireland West Airport Knock. The report recommends a policy that relates to permissible uses to the third-party risk from the possibility of aircraft crashing near an airport. The extent of suitable Inner and Outer Public Safety Zones have been determined for Ireland West Airport Knock (see Fig. 4). The Inner PSZ extends a maximum of 1325m from the runway thresholds and is never more than 96 metres wide. The Outer

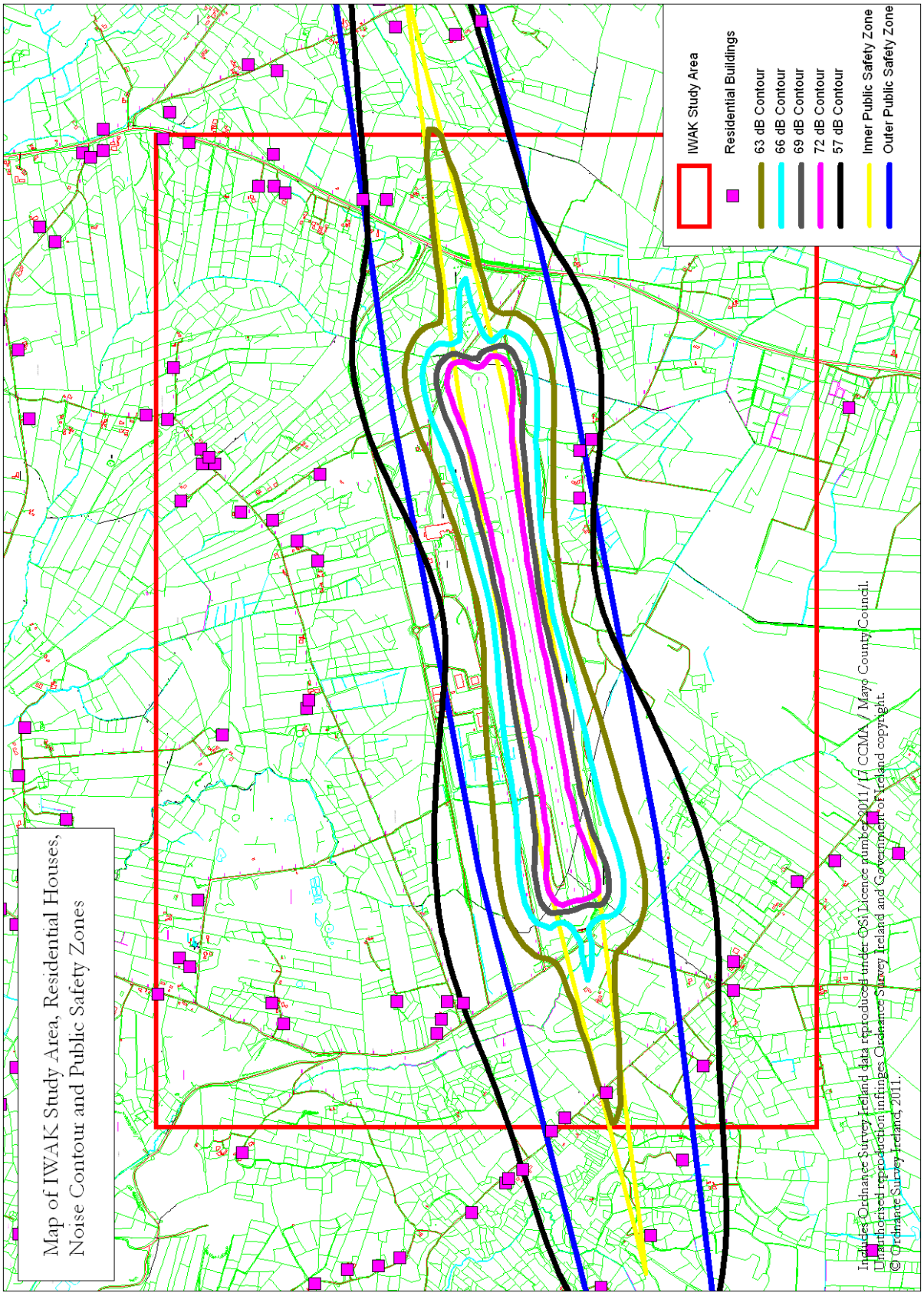
PSZ extend a maximum of 5647m from the runway thresholds and is never more that 261m wide. The permissible uses and restrictions relating to the PZSs are set out in Appendix 1.

4.2.8 Noise

4.2.8.1 Noise Contour Mapping

A report was prepared for Mayo County Council to establish noise contour mapping for Ireland West Airport Knock. The report determines airborne aircraft noise contours based on existing and future aircraft traffic movements as a result of implementation of the Ireland West Airport Knock Planning Scheme. The scope of the work includes prediction of noise contours for a 92-day summer period for scenarios based on existing and future aircraft movements. The noise contours are predicted based on actual and predicted aircraft movements using the federal Aviation Administration (FAA) Integrated Noise Model (INM) Version 7.0b aircraft noise prediction software. The contour methodology is recognised worldwide and is in accordance with the methodology used for strategic noise mapping under European Directive 2002/49/EC. The noise contour maps are shown of Figure 4 and details of implications for development proposals are set out in Appendix 1.

Figure 4 Public Safety Zones and Noise Contour Maps



4.2.9 Radon

The greatest health risk from radiation in Ireland is caused by radon. It accounts for more than half of the total radiation dose received by the Irish population. As a known carcinogen, it is in the same category as tobacco smoke and asbestos it is a cause of lung cancer. There are up to 250 cases of lung cancer diagnosed in Ireland every year that can be linked to radon. These lung cancer cases are principally associated with exposure to radon in the home, but exposure in the workplace is also a contributor. In the workplace, the employer must protect the health of workers from this identifiable risk.

Radon is only a problem if it is ignored and some simple, straightforward solutions are available to reduce excessive levels both in the workplace and in the home. The EPA radon map shows that the SDZ lands are situated within a 10km grid square in an area with a high level of radon present.

4.2.10 Human Health and Air Quality

The Air Framework Directive 96/62/EC (CEC, 1996) details how ambient air quality should be monitored assessed and managed. This Directive requires that member states divide their territory into zones for the assessment and management of air quality.

The Air Quality Index of health is based on hourly monitoring data from sites around Ireland and is based on measurements of five air pollutants all of which can harm health.

The five pollutants are:

- Ozone gas
- Nitrogen dioxide gas
- Sulphur dioxide gas
- PM2.5 particles and
- PM10 particle

The Air Pollution Regulations (2012) were signed into law by the Minister for Environment, Community and Local Government on 31st August 2012. One of the key elements of the regulations has been the designation of new towns as smokeless zones and the expansion of the ban areas in towns that were previously covered under the old regulations. The four local authorities in Dublin have a ban on the sale, marketing, distribution and burning of specified fuel i.e. only smokeless fuel allowed.

The EPA State of the Environment Report (2016) has further highlighted the role of environmental quality and health and in turn has highlighted the adoption of the newer more stringent World Health Organization guideline values for air quality. The Clean Air Policy Package (EC 2014) involves a move to tackling air emissions at source with potentially tighter air quality standards from 2020 onwards.

County Mayo is achieving an air quality rating of '2 – Good' on 19th October 2018.

4.2.11 Existing Environmental Problems relating to Population and Human Health

Incompatible land uses and the restrictions relating to PSZs and Noise Contours could cause a risk to human health. Traffic using the local road network as opposed to the National and Regional routes could also have an impact on pedestrian safety.

4.2.12 Evolution of Population and Human Health in the absence of a Planning Scheme for Ireland West Airport Knock

It is not envisaged that population location trends would substantially change in the absence of a Strategic Development Zone for Ireland West Airport Knock. In the absence of the Planning Scheme, human health may be compromised by development of incompatible land uses within the vicinity of the airport. The natural expansion of the airport with an increase in traffic movements would occur haphazardly without any safeguards in place for the protection of the environment, which may impact on human health in an indirect manner.

4.3 Biodiversity, Flora and Fauna

Biodiversity is defined as the variability among living organisms and the interactions between them. It can include diversity within species, between species and of ecosystems. Almost a third of County Mayo's land area is designated for the protection and conservation of flora and fauna. This high percentage reflects the international and national significance of Mayo's wealth of natural heritage. County Mayo has a particularly rich and diverse natural heritage. Mountains and upland areas are concentrated in the north and west of the county, which is characterised by a mosaic of peatland, heath and forestry plantations. More fertile farmland is found in the low-lying and undulating landscapes of east Mayo. There are several large lakes in the county and numerous small to medium lakes. Lough Conn and Mask are among the largest lakes in the country. The richness and diversity of Mayo's habitats and species contribute to the character of the landscape.

4.3.1 Special Areas of Conservation (SACs) and Special Protection Areas (SPAs)

There are 18 sites in County Mayo designated and protected under the Birds Directive (2009/147/EC) as Special Protection Areas (SPAs) due to their conservation value for birds of importance in the European Union. There are 52 Special Areas of Conservation (SACs) in County Mayo, designated and protected under the Habitats Directive 1992 (92/43/EEC) due to their conservation value for habitats and species of importance in the European Union. SPAs and SACs form Natura 2000, a network of protected areas throughout the EU.

4.3.2 Natural Heritage Areas

There are 15 Natural Heritage Areas (NHAs) and 48 proposed NHAs in County Mayo. NHAs are established and protected under the Wildlife Acts, 1976-2000, due to their conservation value for ecological and/or geological/geomorphological heritage in a national context.

4.3.2 Designated Sites at Ireland West Airport Knock

There are no designated sites within the proposed Ireland West Airport Knock Planning Scheme area. However, the River Moy cSAC is located approximately 2km to the north and south of the study area. Two proposed NHAs are located within 4km of the plan area, namely Killaturly Turlough pNHA and Lough Gower pNHA.

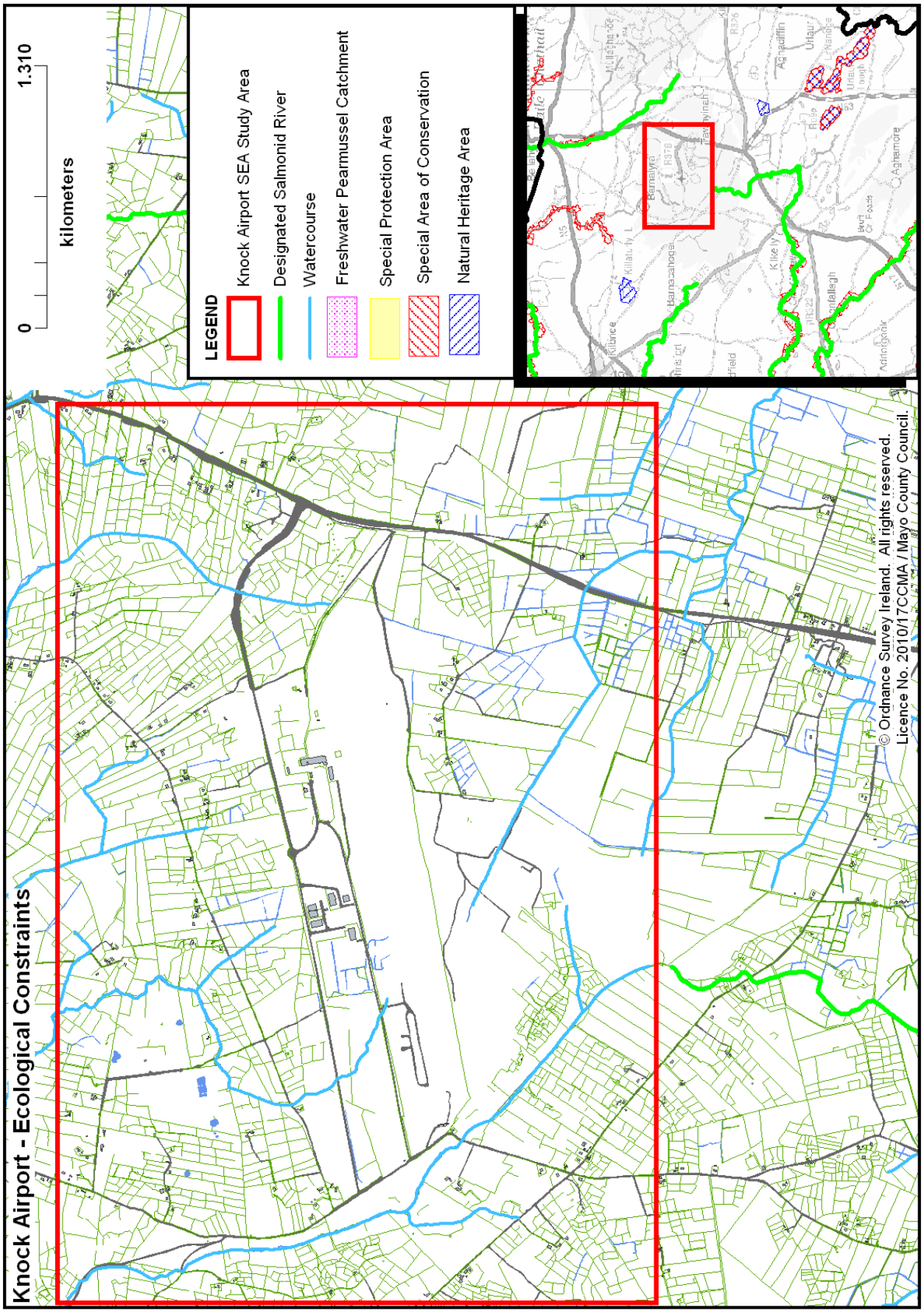
*A separate Appropriate Assessment accompanies this draft Planning Scheme document.

Descriptions of the sites are given below:

Table 9 Designated Sites (Special Areas of Conservation (cSAC) and proposed National Heritage Areas (pNHA)) within a 5km radius the Ireland West Airport Knock Planning Scheme study area

Designation	Site Code	Site Name
SAC	002298	Moy Complex
pNHA	000511	Killaturly Turlough
pNHA	000523	Lough Gower

Figure 5 Map showing sites designated for nature conservation in vicinity of the Planning Scheme area.



Killaturley Turlough Natural Heritage Area: Site Code NHA 000511

Killaturley Turlough, located 4.9km to the northwest of the Planning Scheme area, is a permanent lake set in a hollow between moraines and surrounded by bog. The main water source for the basin seems to be a swallow hole at the eastern end and a stream which flows from the southeast. Where peat has been largely removed, there are reeds (*Phragmites australis*) and sedges (*Carex diandra* and *C. serolina*). Towards the southwest, this community merges into a denser reedbed (*Phragmites australis* and *Typha latifolia*), which is surrounded by rushy fields and patches of peat moss (*Sphagnum* spp). Snipe and water rail nest in the area, while other water fowl are often present. Despite the small area of strictly Turlough vegetation, the site is of value as a composite wetland and therefore warrants NHA status.

Lough Gower Natural Heritage Area: Site Code NHA 000523

Lough Gower NHA is located 4.1km to the southeast of the Planning Scheme area. This small lake lies in the catchment of the Boyle River. The surrounding land is mostly flat or gently undulating bog or improved pasture. The lake bottom is sandy and colonised by aquatic mosses (*Drepanocladus* spp.). The lakewater is a brownish colour, stained by peat and mineral substances, and shows no sign of eutrophication. At is western end, the open water is colonized by swamp vegetation. Floating Bur-Reed (*Sparganium angustifolium*) is of note in that it is not commonly found in low-lying areas such as this. The northern lakeshore is bordered by sloping grassland, which is partially colonized by Gorse (*Ulex europaeus*). Grassland species include Yorkshire fog (*Holcus lanatus*) and Sweet vernal grass (*Anthoxanthum odoratum*). Towards the top of the slope this grade into wet heath, with abundant sphagnum mosses and Ling heather (*Calluna vulgaris*). South of the lake are fields, which have been heavily improved for agricultural use. Perennial rye grass (*Lolium perenne*) is abundant in these grasslands. Lough Gower is of importance as a lake of low nutrient status, which shows no sign of eutrophication. Such lakes are uncommon in low-lying agricultural areas such as this. In addition, it is fringed by semi-natural reed bed/swamp vegetation.

River Moy Special Area of Conservation: Site Code cSAC 002298

The River Moy SAC is located approximately 4.5km to the northwest, northeast and southwest of the Planning Scheme. It comprises almost the entire freshwater element of the Moy and its tributaries, including both Loughs Conn and Cullin. The system drains a catchment area of 805 sq km. The site is a cSAC selected for alluvial wet woodlands and raised bog, both priority habitats on Annex 1 of the EU Habitats Directive. The site is also selected for old oak woodlands, degraded raised bog and Rhynchosporion, all habitats listed on Annex I of the Habitats Directive. The site is also selected for the following species, listed on Annex II of the Habitats Directive – Atlantic salmon, otter, Sea and Brook Lamprey and White-clawed crayfish. Within the site are a number of raised bogs, including those at Kilgarriff, Gowlaun, Derrynabrock, Tawnaghbeg and Cloongoonagh. The Moy system is one of Ireland's premier waters and it also encompasses two of Ireland's best lake trout fisheries in Loughs Conn and Cullin. In addition, the site also supports many more of the mammal species occurring in Ireland. Those which are listed in the Irish Red Data Book include Pine Marten, Badger, Irish Hare, Common Frog and Daubenton's Bat.

There are a number of streams and watercourses located within the Planning Scheme area that are tributaries of rivers in the area, some of which eventually lead to the River Moy. There is potential that the Planning Scheme may impact on the conservation objectives of the protected area. Such potential impacts are highlighted in the Habitat's Directive Article 6 Appropriate Assessment of the Planning Scheme.

Along with sites designated for nature conservation, Mayo has many other areas of local ecological importance including broadleaved woodlands, scrub, hedgerows, tree lines, cutover bog and wet grassland. Many of these areas are important, helping to form wildlife corridors and ecological networks across the landscape. These corridors and networks allow animal species to move freely from one habitat to another.

4.3.3 Local Biodiversity Areas & Ecological Networks

Article 10 of the Habitats Directive recognises the importance of ecological networks as corridors and steppingstones for wildlife, including for migration, dispersal and genetic exchange of species of flora and fauna. Ecological networks are important in connecting areas of local biodiversity with each other and with nearby designated site, so to prevent islands of habitat from being isolated entities. Ecological networks are composed of linear features, such as treelines, hedgerows and rivers/streams, which provide corridors or stepping stones for wildlife species moving within their normal range. They are particularly important for mammals, especially for bats and small birds.

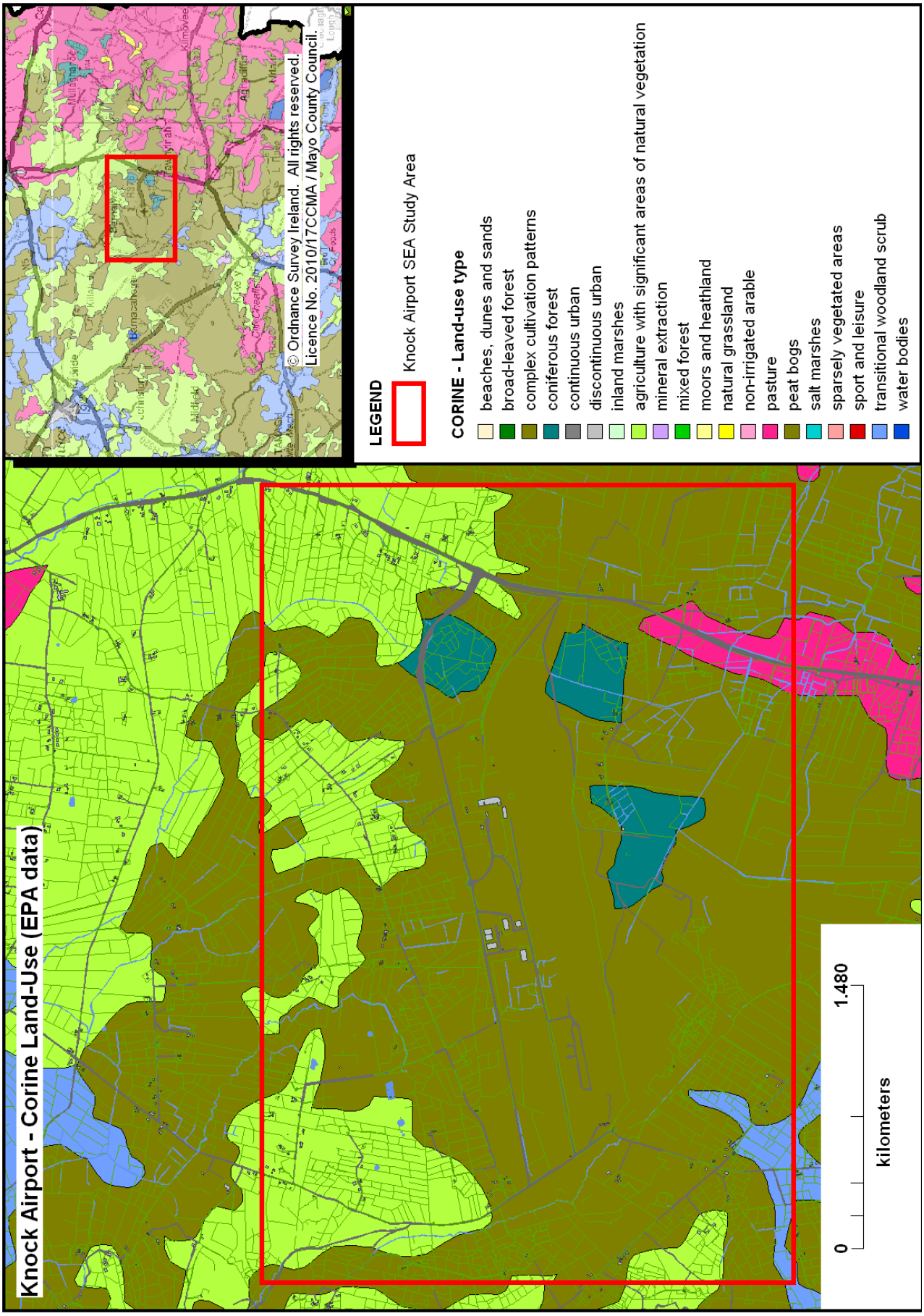
The Habitats Directive requires that ecological connectivity and areas of ecological value outside the network of designated ecological sites are maintained and it recognises the need for the management of these areas through land use planning and development policies.

Mayo County Council completed the process of mapping the habitats of Mayo in 2008. Habitat survey and mapping has been carried out within and around nine towns in the county and a number of Local Biodiversity Areas (LBAs) have been identified. Many LBAs correspond to sites already designated as SACs, SPAs or NHAs. Ecological corridors linking high biodiversity areas have also been identified.

4.3.4 Main Habitats of the SEA study area

Detailed habitat mapping has not been carried out for the Ireland West Airport Knock Planning Scheme SEA study area. A CORINE land cover map of the main habitats in the area is shown in Figure 4.3. Corine Land Cover (CLC) is a map of the European environmental landscape based on interpretation of satellite images. The main habitats within the plan area, have however been identified and described as part of the Ireland West Airport Knock Cumulative EIS, and classified according to Fossitt (2000). They include cutover bog (PB4), wet grassland (GS4), wet heath (HH3), dry humid acid grassland (GS3) and improved agricultural grassland (GA1). Also present are eroding upland rivers (FW1), dry siliceous heath (HH1), exposed siliceous rock and buildings (BL3). Currently, a relatively small proportion of the SEA study area is taken up by the existing airfield, airport terminal buildings and associated landside facilities. The airfield itself comprises the hard surfaces of runways, taxi-ways, aprons, hard stands, associated with airport developments.

Figure 6 Corine Land Cover map of Ireland West Airport Knock and surrounding area.



A description of the main habitats and associated species is given in the Cumulative Ireland West Airport Knock EIS, prepared by the airport authority, as follows:

A number of small fast flowing streams drain the site through the northern and southern boundaries of the Planning Scheme study area. The blanket bog habitats that surround the airport have been significantly modified by human activity, including through turf cutting, drainage and reclamation for agriculture. These drainage ditches are connected to the small streams. The streams which flow to the north and southwest are tributaries of the Sonnagh and Trimogue rivers respectively, which form part of the River Moy cSAC. Improved agricultural grassland occurs in areas where peatland around the airport has been reclaimed for agriculture, comprising a grassy sward of typical agricultural grasses, including *Lolium perenne, trifolium repens, Dactylis glomerta, Festuca* spp*, Holocus lanatus and Poa* spp*.* Where drainage is impeded, vegetation is dominated by *Juncus* spp.

Dry humid acid grassland occurs on shallow free draining soils on the steeper slopes of the site, forming intimate mosaics with dry heath, wet heath and cutover bog. This habitat is characterised by a short sward with tussocks of rushes (*Juncus* spp) prevailing. This habitat is degraded in areas as a result of heavy poaching by grazing cattle. The habitat exhibits a good species diversity of vascular plants, herbs, mosses and a scattering of shrubs including Hawthorn (*Crataegus monogyna*), Gorse (*Ulex europaeus*) and Heather (*Calluna vulgaris*).

Wet Grassland occurs throughout the site, generally on the lower slopes where drainage is impeded and also within the confines of the airport. This habitat occurs within the airport on the lands where excavated peat was reused within the site. This habitat is characterised by rushes (*Juncus articulatus/acutiflorus*), sedges (*Carex* spp), Purple Moor-grass (*Molinia caerulea*), Tormentil (*Potentilla erecta*), Devil's-bit scabious (*Succisa pratensis*), Bog Asphodel (*Narthecium ossifragum*) and Heath Milkwort (*Polygala serpyllifolia*). Bog mosses (*Sphagnum* spp.) can be found in the damp hollows throughout. This habitat often forms mosaics with wet heath and cut over bog. The Wet Grassland habitats found within the study site do not correspond to the EU Habitats Directive Annex I Habitat: 'Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinia caeruleae*)' (6410).

Wet dwarf scrub heath and grassland habitats from a complex mosaic throughout the lands surrounding the airport. Wet Heath vegetation typically occurs on shallow peat, generally under 0.5 metres in depth and occurs on areas of Cutover Bog PB4. The wet heath species include Ling Heather (*Calluna vulgaris*) and Crossed-leaved Heath (*Erica tetralix)*, bilberry (*Vaccinium myrtillus*), Purple Moor-grass and Cotton grass (*Eriophorum vaginatum*). Mosses such as *Rhytidiadelphus loreus*, *Hylocomium splendens* and *Polytrichum commune* are common, with Sphagnum species and Star Sedge (*Carex echinata*) occurring in the flushed areas. Wet heath corresponds to the Annex 1 habitat 'northern Atlantic wet heaths with Erica tetralix (4010)'. This vegetation type occurs throughout the site and is considered to be of moderate conservation value.

Turf banks occur throughout the peatlands surrounding the airport. Bare banks are still evident where turbary harvesting of peat is ongoing. The areas of modified Upland Blanket Bog habitat PB2, that have been cut have re-vegetated with varying assemblages of species, depending on hydrology, depth of peat remaining, nature of the peat and underlying substratum. The peat banks as a result of natural succession have been colonised with heath vegetation. However, the wetter hollows are usually dominated by Deer Grass (*Trichophorum cespitosum*), Bog Cotton Grasses (*Eriophorum angustifolium*) and Bog Asphodel (*Narthecium ossifragum*). The Sphagnum species occur throughout. The annexed habitat 'depressions on peat substrates of the Rhyncosporion (7150)' can occur in pockets on cutover bog. However, this habitat type is more commonly associated with cutover raised bog rather than blanket bog. There is no evidence of this occurring at the site of interest.

4.3.5 Mammals

There were no mature trees within the study site which would provide suitable roosting sites for local bat populations. However, neighbouring old buildings, bridges and mature woodlands on the banks of the Sonnagh River may provide suitable roosting sites. The stream valleys would also provide an adequate food supply of insects. Daubenton's Bats have been recorded within the River Moy catchment, and there may be a possibility of bat activity in the area. A number of hares were observed in the heathlands to the south of the study area on the day the survey was carried out.

Badger setts were not located within the study site. Badger setts may be found in the hedgerows and farmland of the surrounding landscape and the habitats within the SEA study area site may provide badgers with suitable foraging habitat.

No evidence of otter was identified during the survey. Otter is listed in Annex II and IV of the EU Habitats Directive and as a 'protected fauna species' in Annex III of Bern Convention. The Irish population is also listed in the 'Irish Red Data Book 2: Vertebrates' (Whilde, 1993) as being of international importance. No evidence of otter was found on-site. The presence of adequate supplies of fish is the critical factor determining the presence of this species. Otter have been recorded in the River Moy catchment, therefore the tributaries that drain the site may support this species.

The Acid Grassland (GS3), Wet Grassland (GS4), Wet Heath (HH3) and Cutover Bog (PB4) habitats may provide suitable habitat for a range of butterfly species including the Wood White (Leptidea sinapis), Green-Veined White (Pieris napi), Orange Tip (Anthocharis cardamines), Peacock (Inachis io), Ringlet (Aphantopus hyperantus) and Meadow Brown (Maniola jurtina). The Marsh Fritillary (Euphydryas aurinia) was also recorded in the 10X10km square relevant to the SEA study area and is considered one of the most threatened species in Europe and is the only Irish butterfly species protected under the EU Habitats Directive. Devil's-bit Scabious, a favoured food of the Marsh Fritillary was identified in the heath and acid grassland habitats surrounding the site. There was no evidence of the species during the site visit; the species should be surveyed again at a more suitable time of year, between March and October.

4.3.6 Birds

Few birds were recorded on the day of the field visit, particularly within the confines of the airport. This is a result of the airport's bird control measures, which comprises a gunshot being sounded intermittently. Birds seen and heard in the hinterland of the airport include common farmland birds including; Jackdaw (Corvus monedula), Chaffinch (Fringilla coelebs), Rook, Meadow Pipit. Lapwing (Vanellus vanellus) and Snipe (Gallinago gallinago) have also been recorded in the heathlands surrounding the airport. The wooded ravines of the Sonnagh River and agricultural land surrounding the site may support good number of common and farmland bird species. Old farm buildings can also provide valuable roosting sites for bird species. Bird's nests, possibly Swallow (Hirundo rustica), were found within the farm buildings to the south west of the airport.

4.3.7 Existing Environmental Problems relating to Bio-diversity, Flora and Fauna

While Mayo has a rich and diverse natural heritage, many of our habitats and species are however under threat. The main threats to biodiversity in the county are habitat destruction and fragmentation, land clearance and development pressure, poorly-managed commercial forestry, drainage, pollution, invasive alien plant and animal species and climate change.

The heath and bogland habitats within the study area are sensitive to changing conditions or influences. The area of cutover bog directly north of the existing Airport Terminal and car park has been extensively drained and is vulnerable to scrub encroachment. It is also severed from similar habitats by a series of access roads, which have also contributed to the drying out of the bog. Other areas of bog habitats have been subject to extensive turbary activities and some grazing pressure.

In relation to Ireland West Airport Knock or indeed any airport, one of the environmental problems is the effect of the operation of the airport on birds in the area and the potential for bird strikes.

4.3.8 Evolution of Bio-diversity, Flora and Fauna in the absence of a Planning Scheme for Ireland West Airport Knock

Currently, the area consists of a functioning airport, surrounded by habitats that have been subject to varying degrees of disturbance. The habitats comprise a mosaic of cutover bog, wet heath and grassland habitats. Any future proposed developments at the airport would have to have regard to the policies and objectives of the County Development Plan and current national and EU legislation pertaining to the protection of biodiversity.

In the absence of a Planning Scheme it is likely that any development at the airport would take place in an ad hoc piecemeal manner. Without an overall habitat/landscape strategy for the area, development could have a negative impact on biodiversity, including ecological connectivity, in the

area. Applications likely to impact on designated sites would be subject to Appropriate Assessment under Article 6(3) and 6(4) of the Habitats Directive.

4.4 Soils and Geology

4.4.1 Soils

Soil is the top layer of the earth's crust, formed of mineral particles, organic matter, water, air and living organisms. It is considered a non-renewable natural resource, as it is formed by a complex series of processes which occur over long timescales. Soil is an extremely variable and living medium and performs many vital functions including food and other biomass production, storage, filtration and transformation of many substances including water, carbon and nitrogen. Damage to soil structure has repercussions to other environmental media and ecosystems. Although soil is not yet protected, provisions in favour of soil protection are spread across many policy areas and are usually designed to safeguard other environmental media. EU Habitats directive protecting areas of peat – raised bogs and blanket bogs are designated as Special Areas of Conservation, SAC's.

In 2006 the European Commission adopted a soil thematic strategy, which is designed to halt and reverse the process of soil degradation, ensure healthy soils for future generations and remain capable of supporting the ecosystems on which our economic activities and wellbeing depend. (Environment fact sheet: soil protection – a new policy for the EU, European Commission 2007).

4.4.2 Topography

Based on the OSI 1:50,000 Discovery Series Map No. 32 series and site topography maps, the site is located on elevated terrain and falls from the southern boundary at an elevation ranging from approximately 201 m OD (metres above Ordnance Datum) along the airport entrance road to the northern boundary at approximately 189 m OD. The regional link road is raised above the northern boundary of the site at approximately 193 m OD. The majority of the area comprises heathland scrub, wet grassland and blanket bog with some areas of bedrock exposure and numerous cobbles / boulders

Figure 7 Soils: Thematic by Category

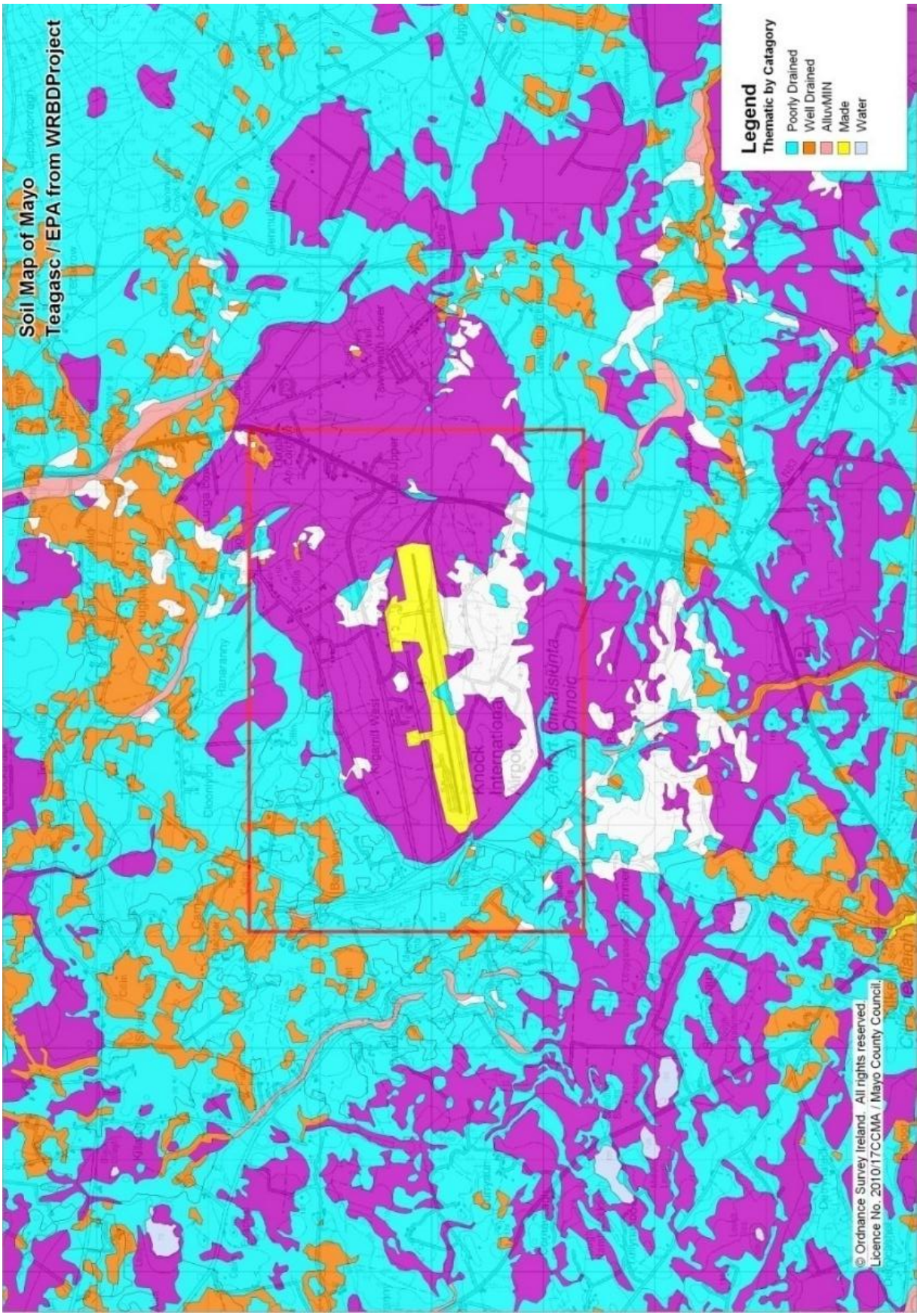
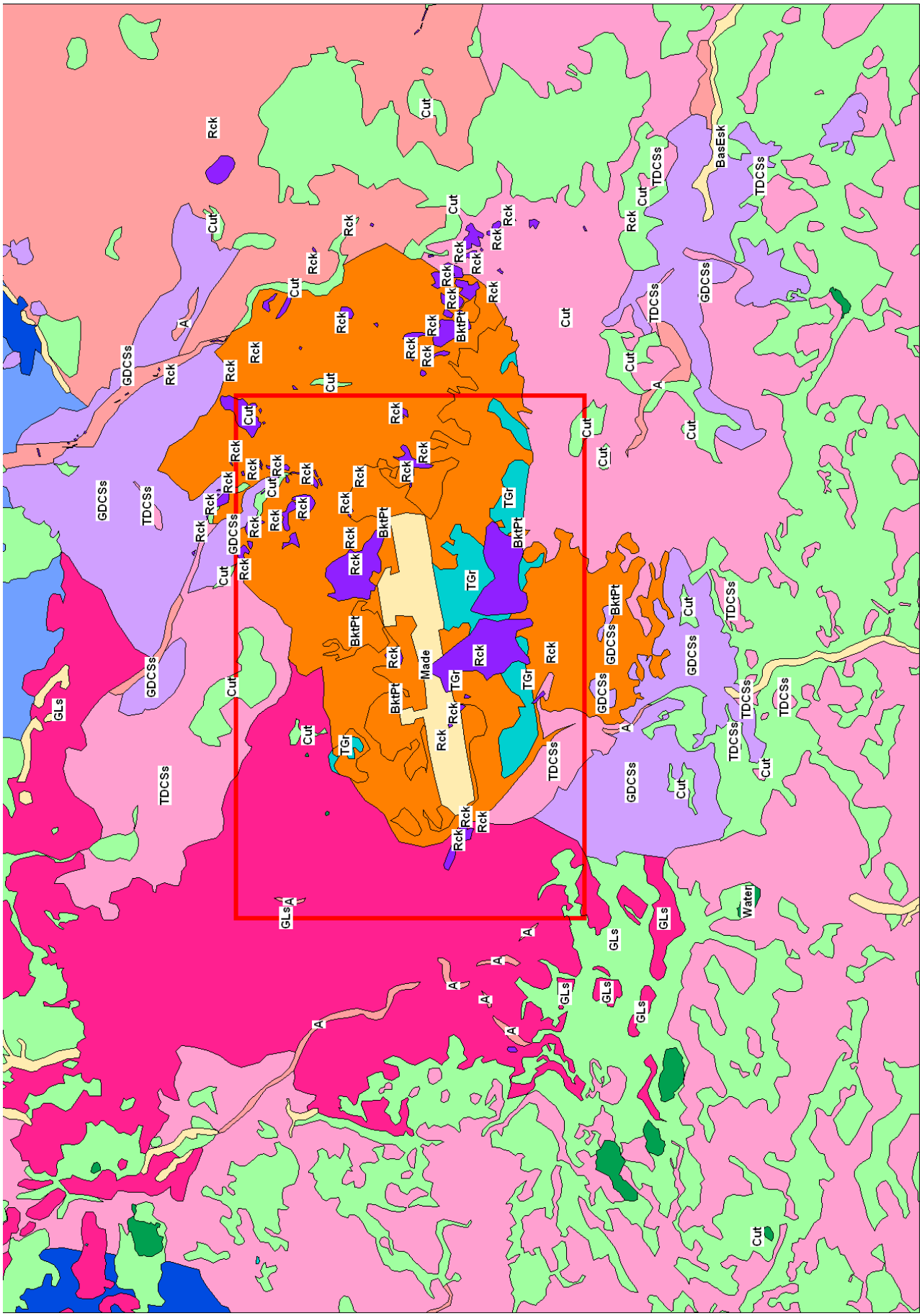


Figure 8 Soil Classification



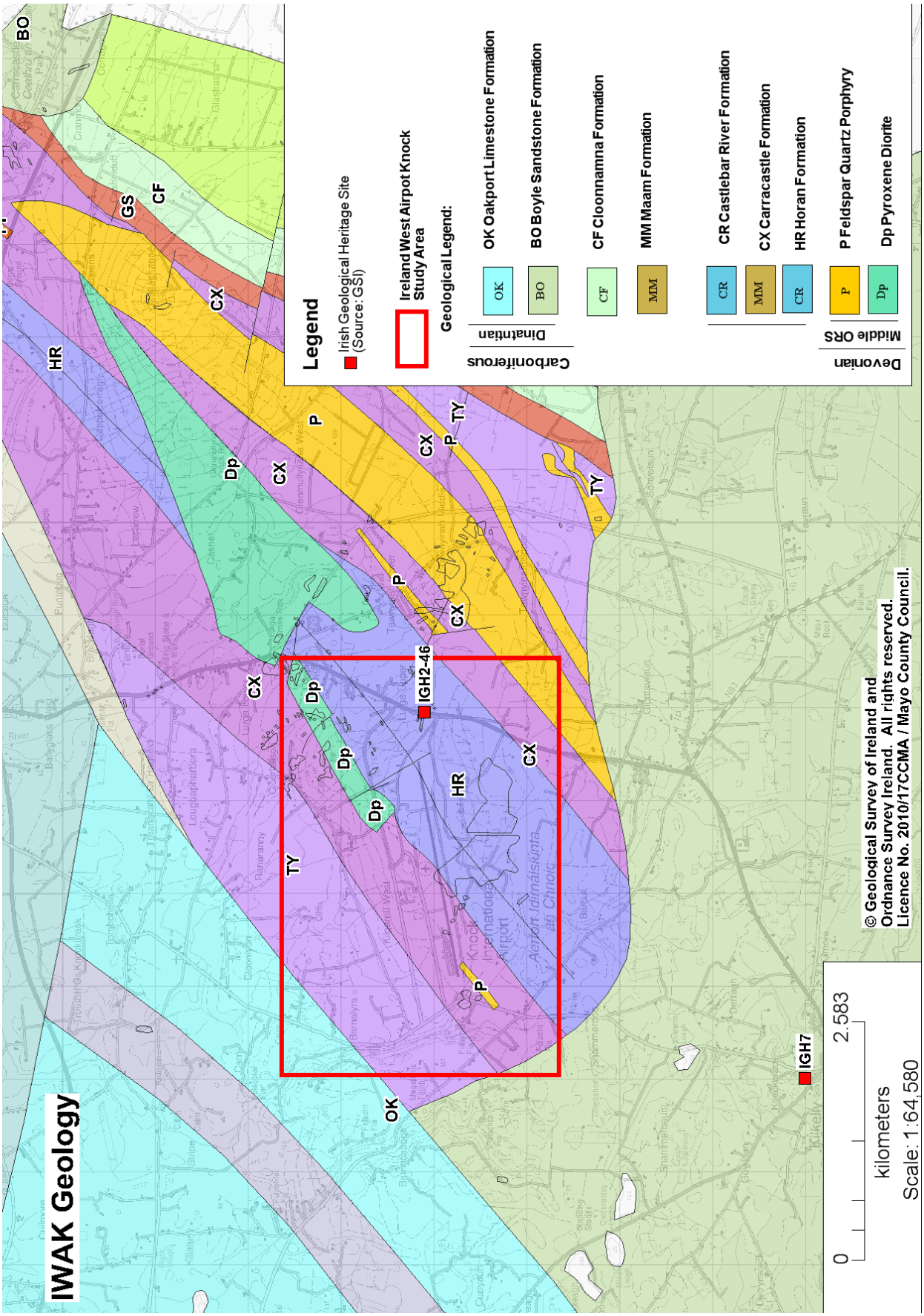
The soil associated with the study area of Ireland West Airport Knock mainly consists of blanket peat, with areas of exposed bedrock in places throughout the blanket peat, and various types of till. The runway and associated developed areas of the airport itself are comprised of made ground. There are also areas of sandstone sands and gravels, bordering the north and south of the study area

4.4.3 Geology

The study area comprises mostly of the Ordovician volcanic sequence of the Charlestown Inlier. This sequence runs from oldest to youngest as follows: Horan Formation basalts with chert and siltstone, Carracastle Formation of andesitic volcaniclastic rocks and Tawnyinah Formation of quartz-felspar crystal tuffs and fine felsic tuffs. The Oakport Limestone formation lies to the northwest of the study area and the Boyle Sandstone formation dominates to the south of the study area. Finally, there are slight occurrences of minor intrusive bodies of Caledonian Age – Feldspar Quartz Porphyry and Pyroxene Diorite.

The Sand and gravel deposits to the west and southwest are classified as a Locally Important Sand and Gravel Aquifer. The Geological Survey of Ireland have records of four wells in the study area. The source of the Ireland West Airport Knock water scheme is located to the northeast of the study area. There are also a number of operational quarries within the vicinity.

Figure 9 Ireland West Airport Knock Geology



4.4.4 Existing Environmental Problems relating to Soils and Geology

There are no apparent exiting environmental problems relating to soils and geology in the study area. There have been no recorded landslides in the area, but peat is prone to saturation and when disturbed may become saturated and unstable.

4.4.5 Evolution of Soils and Geology in the absence of a Planning Scheme for Ireland West Airport Knock

In the absence of a Planning Scheme, the airport and associated areas would develop in an ad-hoc manner and not have mitigation for soil/peat exposure, erosion and groundwater seepage/runoff which will is discussed in the section relating to alternative scenarios. With no Planning Scheme, and no development of Ireland West Airport Knock there would be minimal impact on Soils and Geology.

4.5 Water

4.5.1 Introduction

The EU Water Framework Directive (WFD) establishes a framework for the protection of all waters including rivers, lakes, estuaries, coastal waters and groundwater, and their dependent wildlife/habitats under one piece of environmental legislation. River Basin Management Planning takes an integrated approach to the protection, improvement and sustainable management of the water environment. The WFD planning process revolves around a six year planning cycle of action and review, so that every six years a revised River Basin Management Plan (RBMP) is produced. The RBMP sets out the actions that Ireland will take to improve water quality and achieve good ecological status in water bodies (rivers, lakes, estuaries and coastal waters) by 2027.

The first planning cycle ran of River Basin Management Planning ran from 2009-2014, the second planning cycle runs from 2015 -2021. The current RBMP aims to build on the progress made during the first planning cycle. The approach to plan development involves characterisation of Ireland's water bodies in order to develop a tailored programme of measures to allow for the protection of good status or the restoration of good status for all water bodies.

The characterisation process aims to classify all waters in terms of quality status and risk. Under the WFD, rivers and lakes are classified into five quality classes (Status), *High, Good, Moderate, Poor and Bad.* Groundwater is classified using two statuses, *Good* and *Poor*. Risk is described in terms of the risk of not achieving the water framework directive objective, three terms are used, *at risk, not at risk* or in review. One of the main objectives of the WFD is to ensure that the status of water bodies is protected, maintained and improved in line with the requirements of the WFD.

4.5.2 Water Quality Baseline Data

Hydrogeology: The plan area overlies two separate groundwater bodies; Kilkelly-Charlestown and Curlew Mountains, both of which are at *good* status and *not at risk* of meeting the WFD Directive objective in the current River Basin Management Plan 2018 to 2021.

The aquifer underlying the majority of the plan area is classified by the Geological Survey of Ireland as a *poor aquifer* (Pl) and unproductive except for local zones. A *locally important gravel aquifer* (Lg), known as Swinford gravels, underlies the extreme north western corner of the site. An extensive quarry operated by *Harringtons Concrete and Quarries*, 350m to the northwest of the SDZ boundary, is currently extracting material from this geological resource.

The aquifer vulnerability in the north of the SDZ, where the majority of the development is proposed, is classified as High, which means that there is 3m-5m of subsoil overlying the aquifer.

Extensive areas of Extreme and X-Extreme (rock at or near the surface) aquifer vulnerability are mapped to the east and southeast of the existing carparking area. The footprint of the airport terminal and associated building are located within this area.

Surface Hydrology: Surface water in the IWAK SDZ area, as shown in Figure 10, drains to two catchments – the Moy Catchment (34 Moy & Killala Bay) in the north and the Shannon Catchment (26B Upper Shannon) to the south.

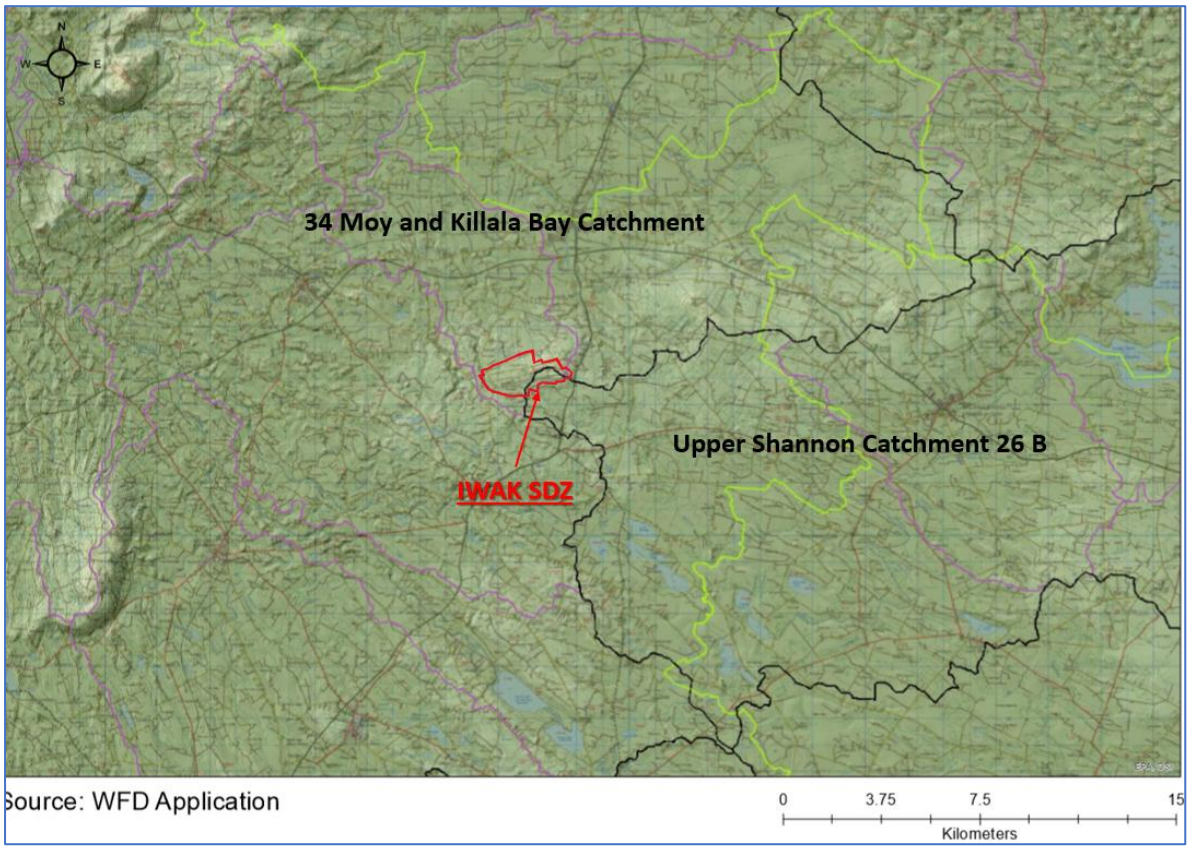


Figure 10 IWAK SDZ relative to WFD River Catchments

As shown in Figure 10, the area to the north and east of the airport runway and terminal is drained the Sonnagh (MOY)_010 waterbody (IE_WE_34S020100). This waterbody flows northwest for 12km and enters the Moy_070 at Gurteen Bridge at Cornageeha 5.5 km northeast of Swinford. This waterbody is currently at *moderate ecological status* with land drainage and emissions from IWAK Wastewater Treatment Plant considered to be the significant pressures contributing to its less than

good ecological status. The Sonnagh (Moy)_010 waterbody is classified as *at risk* of not achieving its WFD objective of good ecological status.

To the south of the airport, one 1st order stream of the Lissydaly Stream_010 Waterbody rises within the SDZ and flows southeast for 15km before entering the Lung_010 Waterbody at Lissydaly Bridge as shown in Figure 11. The Lissdaly Stream_010 waterbody is currently assigned *good* ecological status (2010-2015) and is *not at risk* of failing to meet the WFD targets in 2021.

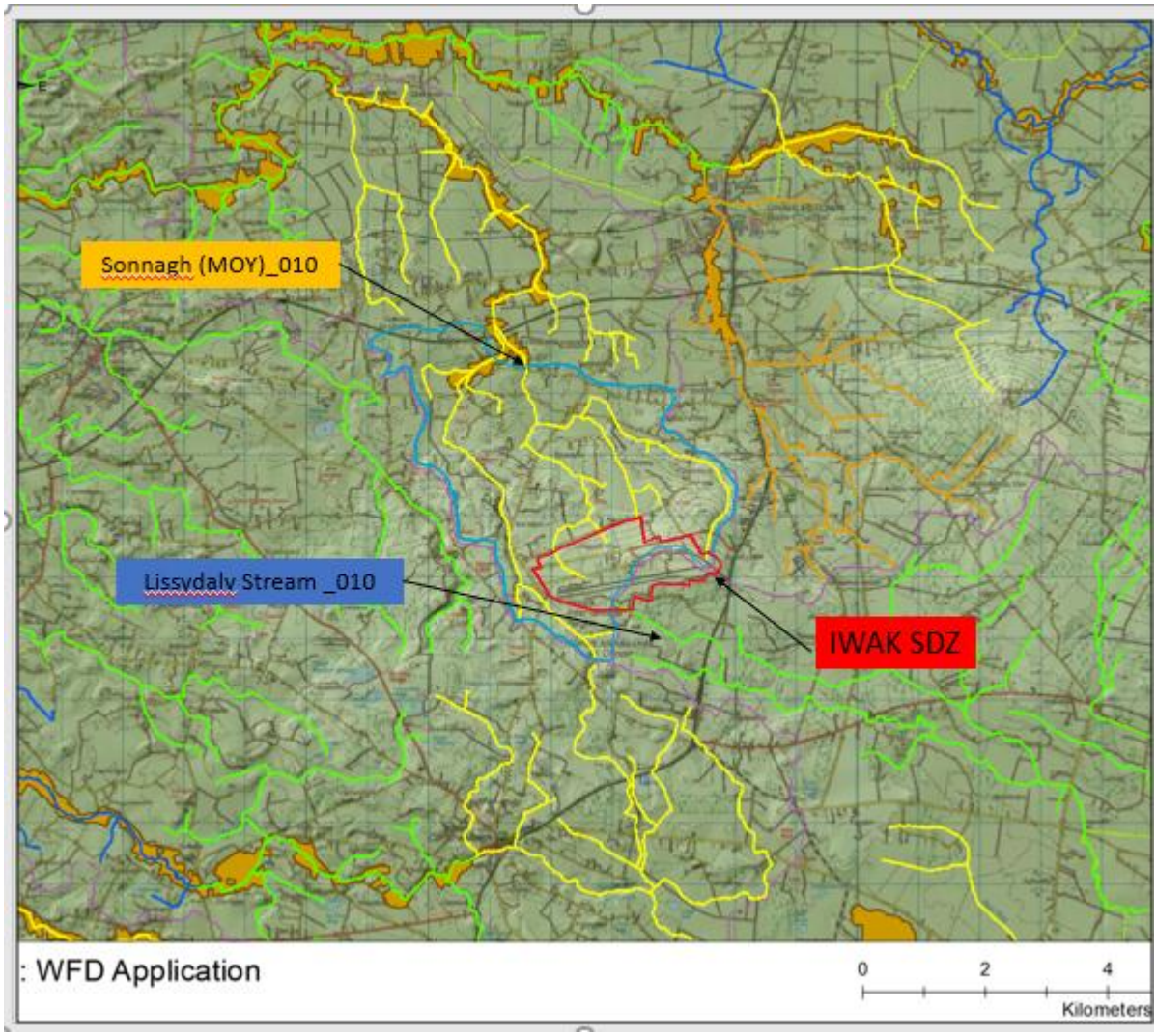


Figure 11 Ecological Status of water bodies within IWAK SDZ Area

In terms of sensitive waters listed under Part 1 of the Third Schedule of the Urban Wastewater Treatment Regulations, 2001 (S.I. 254 / 2001), there are no designations within the study area or bordering catchments. In contrast, the first and second order streams in the study area are tributaries of the River Moy, a designated Salmonid river under EC (Quality of Salmonid Waters) Regulations (S.I. No. 293/1988).

4.5.3 Freshwater Ecology Baseline Data

The study area is drained by first and second order tributaries of the River Moy; a notable SAC designated under the Habitats Directive 1992 (92/43/EEC) for the protection and conservation of habitats and species. The Moy Complex SAC (site code: 002298) has been assigned in consideration of habitats such as 'depressions of peat substrates of the Rhynchosporion', 'old sessile oak woods with *Ilex* spp. and *Blechnum* spp.' and for taxa including Brook lamprey *(Lampetra planeri),* Otter *(Lutra lutra)* and White-clawed crayfish *(Austropotamobius pallipes).* First and second order tributaries of the Moy drain the water bodies of the study area, indicating potential impacts on the SAC species and habitats. The following table summarises the SAC and NHAs within or potentially influenced by the Ireland West Airport Knock study area.

Table 10 Designated Sites (Special Areas of Conservation (SAC) and National Heritage Areas (NHA)) within a 5km radius the Ireland West Airport Knock Planning Scheme study area

Designation	Site Code	Site Name
SAC	002298	Moy Complex
NHA	000511	Killaturly Turlough
NHA	000523	Lough Gower

Other protection offered to freshwater ecological taxa is afforded under EC (Quality of Salmonid Waters) Regulations (S.I. No. 293/1988). Designated Salmonid waters in County Mayo under this legislation include the River Moy and its network of tributaries; the Owengarve, Mullaghanoe, Spaddagh, Trimoge, Glore, Yellow, Gweestion, Manulla, Castlebar, Deel and Corry. While none of these rivers drain the study area, Fig. 11 illustrates that the first and second order streams within the Ireland West Airport Knock study area are tributaries of the River Moy. This aquatic pathway would conclude that the Salmonid species of the River Moy may be potentially impacted by any development in the vicinity of Ireland West Airport Knock. No lakes are located within the study area but turloughs, defined as seasonal or ephemeral standing water bodies are notable in the study area; two are designated as Natural Heritage Areas (NHA) in consideration of waterfowl, aquatic mosses, birds, swamp and semi-natural reed beds in the case of Killaturly Turlough while Lough Gower NHA has been designated in consideration of birds only. These Natural Heritage Areas (NHA) are located a few kilometres north and south of the study area.

An Appropriate Assessment has been carried out on the proposed SDZ planning scheme and the Natura Impact Report accompanies this document.

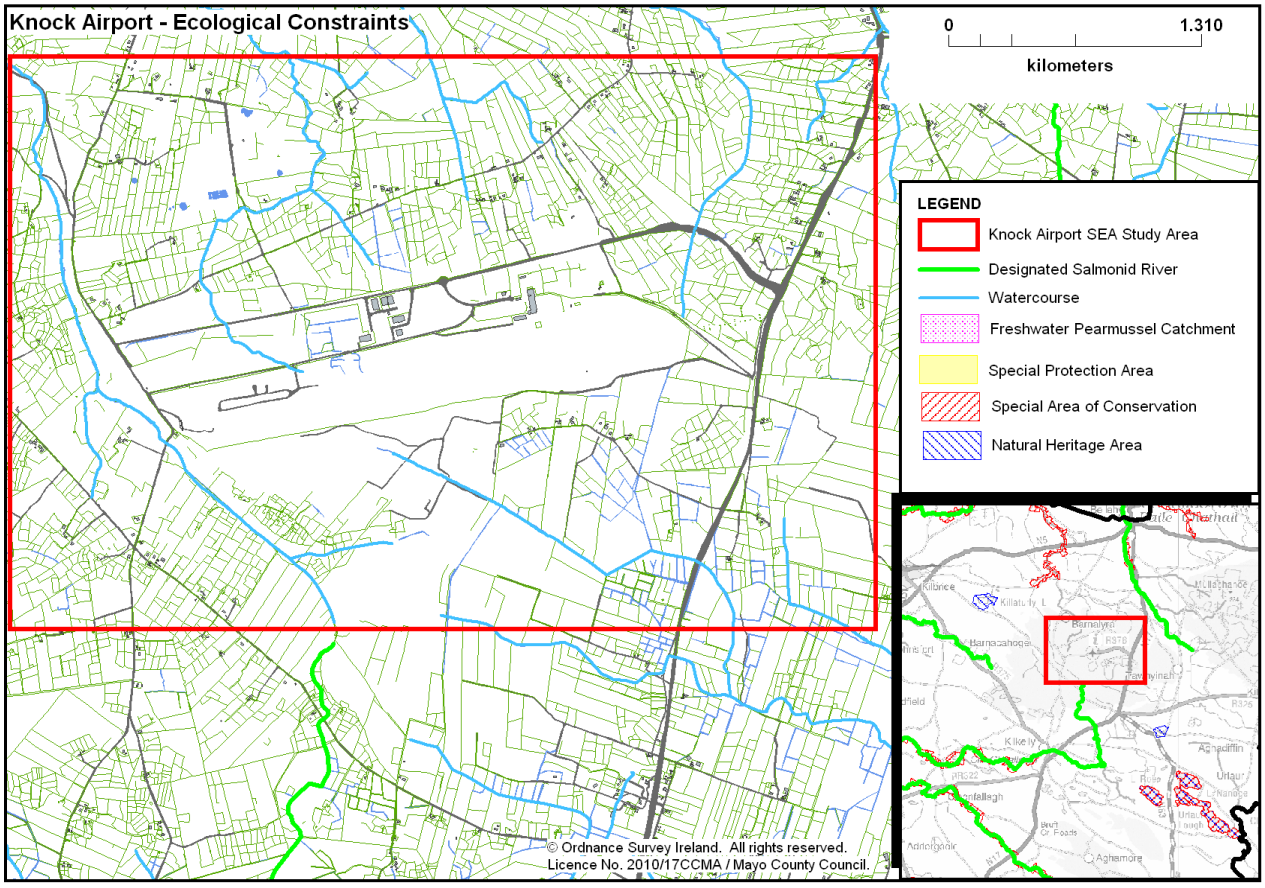


Figure 12 Natura 2000 Sites and designated Salmonid waters bodies within the study area

4.5.4 Effluent Baseline Data

Currently there are no IPPC licenses or Section 4 licences within study area. The Knock Airport WwTP is currently operating at approximately 30% capacity and discharges to the Sonnagh River. This plant currently operates under a waste water discharge licence issued by the Environmental Protection Agency.

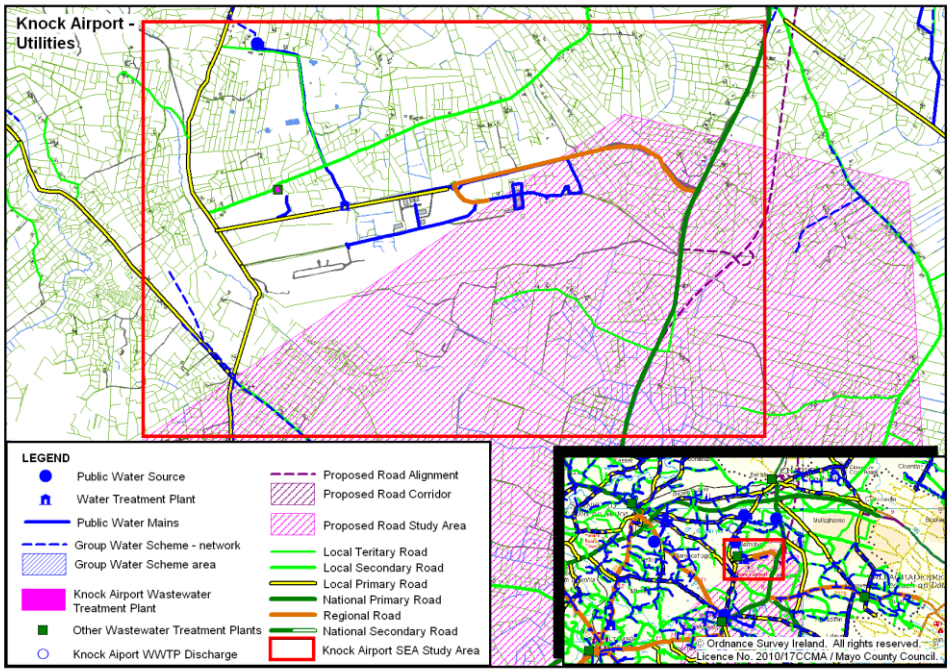


Figure 13 Ireland West Airport Knock Wastewater Treatment Plant, primary discharge point and other utilities

4.5.5 Existing problems of environmental water quality, freshwater ecology and effluents

The primary challenge identified within the study area is the protection and / or improvement of water quality in the water bodies in the vicinity of Ireland West Airport, Knock and its environs. Considered a largely rural and sparsely-populated area, water status is designated based on element descriptions such as *inter alia* macroinvertebrate status, diatoms status, fish status or general physico-chemical status. For example, a poor status indicates water bodies with poor diversity and abundances of aquatic flora, macro invertebrates or unsatisfactory compositions of fish fauna or unsuitable hydromorphological elements, less-than-good chemical and physico-chemical elements and general conditions including nutrient and oxygenation conditions.

Overall, the high density of streams in the southern part of the SDZ is due to impermeable nature of the underlying bedrock providing a small contribution to the baseflow in the streams with the exception of springs and seeps. Water movement will be rapid overland flow to the streams via local drainage ditches.

In this scenario, suspended solids and excess nutrients in the soils generated due to land disturbance or excavation works has potential to transfer sediment into the drainage network and deposit further downstream as the flow velocities begin to decrease.

The potential for groundwater contamination in this scenario conversely, is low due to the impermeable nature of the bedrock.

Specifically, in terms of the principal objective of the WFD, the *good* status water body in the southeast of the site (Lissydaly Stream_010) was designated in consideration of its macroinvertebrate status (likely the presence of an abundant and diverse community of sensitive and less sensitive fauna) and

must be protected, preventing any deterioration in this status. Therefore, while this water body is not exhibiting any problems at present, there must be an emphasis on protecting its current status.

In addition, the moderate status water body (Sonnagh (Moy)_010, which is a tributary of the River Moy and encompasses a significant part of the study area and is based on its macroinvertebrate status. As a consequence, the objective of the River Basin Management Plan ìs to restore *good* status. Increases or introduction of point and diffuse discharges during construction, excavation and operational phases of most projects inevitably occur. There is also potential for accidental release and fugitive emissions which may alter the physico-chemical and biological characteristics of a water body. These alterations not only impact on the water quality of the Sonnagh (MOY)_010, but by extension, on the River Moy, into which the Sonnagh (MOY)_010 flows.

Specific risks or challenges have been identified and summarised for the entire catchment area. Risks include discharges from licenses under the Wastewater Discharge (Authorisation) Regulations, 2007, licences issued under Water Pollution Acts 1977 to 1990, IPPC licences and authorisations under the Waste Management Regulations of 2007 (as amended). In addition, unlicensed discharges from agricultural sources are correlated with increases in nutrient concentrations, particularly phosphorus and nitrogen, the principal eutrophication-promoting and pervasive nutrients associated with organic water pollution and with disturbance of the freshwater quality and to water-dependant ecological elements of water bodies.

Additionally, physical damage to riparian and littoral zones of rivers and lakes from overgrazing and intentional modification, runoff from forestry lands and peat bogs all contribute dissolved nutrients and suspended solids to water bodies; all potential threats to aquatic species. Silt suspended, and dissolved solids can interfere with the gills and spawning beds of fish and macroinvertebrate communities, while increased nutrients promote the growth of pollution-tolerant taxa and the consequential loss of more sensitive indigenous taxa.

Habitat loss is an additional problem; resulting in the disturbance or irreparable damage of water-dependant taxa and communities of keystone species. Typical candidates are freshwater pearl mussels and white-clawed crayfish. Competition from invasive species following introduction to water bodies is a notable challenge facing water quality and aquatic ecological elements. *Lagarosiphon major* and *Dressiena polymorpha* are notable invasive species, while the threat from the very aggressive *Dikerogammarus villosus* is omnipresent.

Flooding is another challenge within the study area. While flood risk data from the OPW indicates that flooding *within* the study area does not seem to be a substantial risk, the areas surrounding the study area contains lands which have been designated as OPW benefitting lands, in addition to water bodies which have experienced past flooding events. Figure 14 illustrates the areas surrounding the study area which have been classified as prone to flooding. A Flood Risk Assessment accompanies this document.

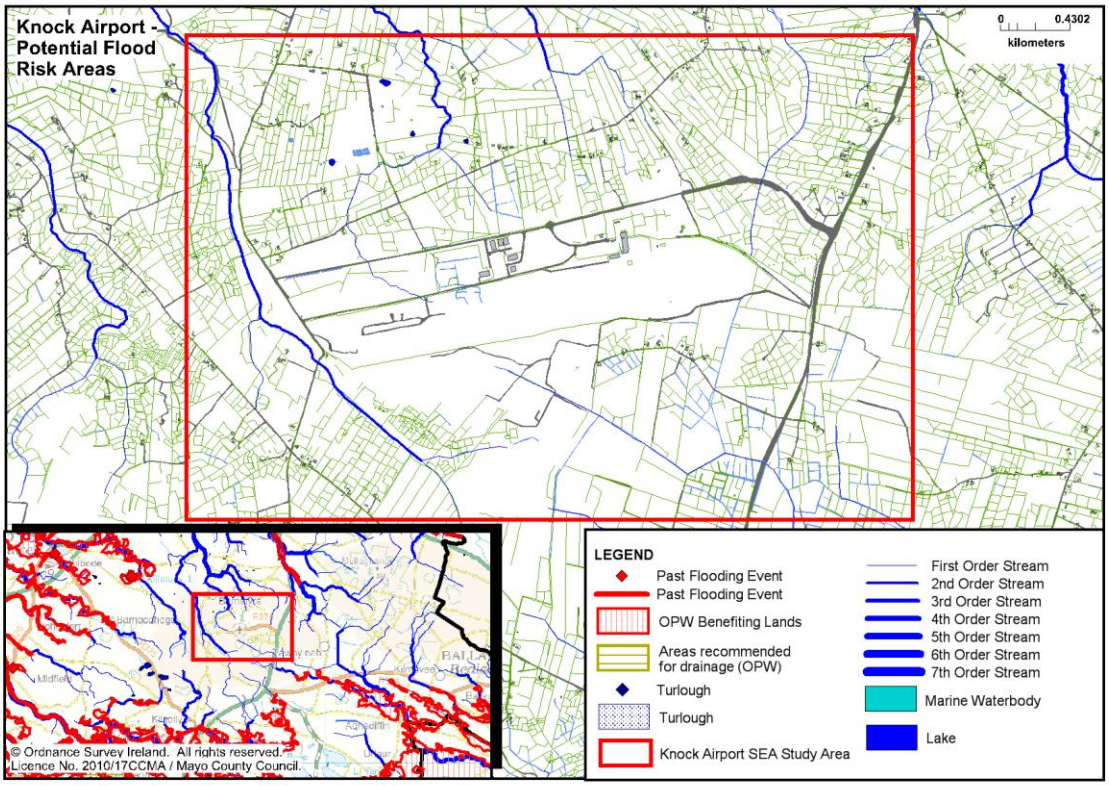


Figure 14 Rivers which experienced flooding events and those designated as OPW benefitting lands

Any proposed development within the study area would require a screening process to determine whether or not a Natura Habitats Assessment should be undertaken for the protection of the proximate Natura 2000 sites – SACs and NHAs. Any proposed development within the study area will require a Natura Habitats Assessment. The restoration of the *moderate* status water body within the study area to *good* status by 2021 / 2027 and the protection and maintenance of the *good* status body is the main priority at present.

Maintaining the quality of the good status water body is potentially more problematic than restoring the status of a less than good status water body, since measures with associated objectives to restore a less-than-good water body are likely to be more achievable than those to maintain a good (or high) status water body. For example, a small loading of phosphorus will likely have a much more damaging impact on the ecology of a good or high-status system than a similar introduction into an already eutrophic system of less-than-good status. Similarly, small increases in silt inputs, hydromorphological pressures or priority substances will have an apparently disproportionate impact on good or high-status systems relative to the impact of the same inputs to an already degraded system, which must be restored. It is therefore critical that measures to protect good and high-status water bodies from becoming degraded are developed and implemented with due diligence.

4.5.6 Evolution of environmental factors in the absence of the Planning Scheme for Ireland West Airport Knock

In the absence of the Ireland West Airport Knock Strategic Development Zone, development in this area would potentially occur with no specific strategic plan and as such the importance of water statuses in this region may be underestimated by the employment of a subjective approach and incompatible development not conducive to surface water protection and restoration. Freshwater quality and its ecological elements, including water bodies' statuses and their respective protection and / or restoration would be potentially impacted upon depending on the types and nature of planning applications. A Planning Scheme would guide sustainable development while concurrently observing the protection and maintenance of the *good* status water body and ensuring adequate protection and furthermore restoration of the *moderate* status water body in a sustainable developmental approach, employing all relevant and appropriate measures developed and described in the River Basin Management Plan 2018-2021.

4.6 Air Quality and Climatic Factors

4.6.1 Air Quality Legislation and Monitoring

Air quality monitoring is undertaken in accordance with relevant Irish ambient air standards which have been adopted from the European Commission Air Framework Directive (96/62/EC) and the associated Daughter Directives on air quality (1999/30/EC, 2000/69/EC). The Irish Air Quality Standards Regulations, S.I. No. 271 of 2002 specify limit values in ambient air for sulphur dioxide (SO2), lead (Pb), particulate matter (PM10) (Stage I), carbon monoxide (CO), nitrogen dioxide (NO2) oxides of nitrogen (NOx), particulate matter (PM10) and benzene (C6H6). The limit values have been set with regard to scientific and medical evidence on the effects of the particular pollutant on health or depending on the context the wider environment.

The Air Framework Directive (96/62/EC 1996) requires that member states divide their territory into zones for the assessment and management of air quality. For Ireland, four zones are defined in the Air Quality Regulations (2002), amended by the Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations (2009). The air quality monitoring data for County Mayo refers to information collated for Zone D, the study area of Knock Airport is within this zone.

The air quality aspect of the airside operations at the Ireland West Airport Knock has not been measured or modelled with regard to the dispersion of aircraft emissions. However, the EIS prepared by the RPS Group for the Ireland West Airport Knock development in Feb 2010 makes reference to an Environmental Impact Statement for the Dublin Airport Parallel Runway, where estimated emissions of nitrogen oxide, carbon monoxide, particulates and hydrocarbons for the Landing and Take-off (LTO) cycle were undertaken. The aircraft movements for the Dublin Airport were far greater (ten to twenty times greater) than that at Ireland West Airport Knock. The results of the Dublin Airport assessment indicated that the aircraft emissions did not have a significant effect on ambient air quality and that the concentrations of key pollutants would remain well below the Air Quality Limit Values. It can therefore be concluded that the flights at Ireland West Airport site have no discernible impact on local air quality.

In terms of landside operations and the greater study area the movement of vehicles and the use of on-site energy installations at the Ireland West Airport Knock study site contribute to potential emissions of SO2, NOx, CO, particulate matter (including PM2.5/PM10), volatile organic compounds (VOCs) and polyaromatic hydrocarbons (PAHs). The impact of these emissions is localised, and local

wind conditions aid dispersion. The local road network is adequately designed for increased capacity, therefore reducing periods of congestion and associated conditions where emissions. In addition, the emissions are not concentrated at any particular time and dispersion characteristics at the site are good due to location.

The impact of fugitive dust emissions generated from quarrying operations in the townland of Barnalyra; namely CEMEX ROI, planning reference 09/690 and Brendan O Grady (QY48) depend on surface characteristics, wind direction, wind speed and other meteorological conditions such as precipitation. Dust emissions could potentially have implications for the level of dust generation on roads, car parks and other hard standing areas. Both quarries operate under planning controls.

The Air Quality Index is based on an hourly monitoring data and sites around Ireland and is based on the measurements of five air pollutants which affect the health of humans. They are: Ozone Gas, Nitrogen Dioxide Gas, PM 10 Particle, PM 2.5 Particles and Sulphur Dioxide Gas.

County Mayo is categorised as Rural West by the EPA and is achieving an air quality rating of 1- good status on 26 July 2018.

4.6.2 Noise

The Ireland West Airport Knock study area is located on an elevated site in a rural setting. The predominant influences on the noise climate in this area include road traffic noise from the N17 and R367 road network and intermittent aircraft related noise from the airport. noise from a gravel quarry which is located to the northwest of the complex may also contribute to the noise climate in the area due to movement of vehicles associated with the quarry.

Air and ground noise is created by:

- Aircraft approaching and taking off from the airport, by taxiing aircraft and by the engine running on the airfield. It is caused by two things by air going over the aircraft's fuselage and wings - known as the airframe and by aircraft engines. The physical characteristic to consider are the duration of a single noise event its frequency and time of occurrence. The number of aircraft a day and their time of occurrence can strongly influence annoyance levels
- Road traffic volumes on the adjacent N17 and R367 road network generate road traffic noise.
- Noise from cars manoeuvring and parking within the car park of the airport and heavy good vehicles operating in the nearby business park and quarrying sites. Car and bus engines idling may also present a source of low-level continuous noise, although propagation towards any NSR is likely to be minimal.

As a component of the Environmental Impact Statement for Ireland West Airport Knock undertaken by RPS in 2010, noise measurements were performed at a total of 4 noise sensitive receiver locations. Noise levels were recorded in accordance with the international standard ISO1996-1:2003 "Acoustics - Description, measurement and assessment of environmental noise - Part 1: Basic quantities and assessment procedures". The choice of locations as investigated in the baseline survey assessed in

the report was made having due regard to the most exposed NSR to potential sources of environmental noise related whether directly (a noise) or indirectly (road traffic noise) to current and proposed airport activities. Ensuring that reasonable representation of baseline noise levels in the vicinity of the airport where noise climate is likely to be heavily influenced by either road or air traffic noise.

The baselines survey undertaken for the Environmental Impact Assessment allowed for the contribution of individual sound sources such as road or air traffic to the overall noise climate in the area to be determined and also served to provide an estimate of the accuracy of calculated road or air traffic noise by cross reference.

A noise sensitive receptor is defined by the EPA environmental noise survey guidance document 2003 as any dwelling house, hotel or hostel, health building, educational establishment or any other facility or area of high amenity for its proper enjoyment requires the absence of noise at nuisance level.

Measurements were undertaken at each measurement location to allow for variations in the daily temporal noise climate, measurements were also taken at each location during the day, evening and night periods as specified in the Environmental Noise Directive. Unattended 24-hour noise measurements were performed at a total of 3 noise sensitive receiver locations in the vicinity of the airport. The first two of these 24-hour monitoring units were positioned specifically to determine aircraft noise from take-off and landing procedures at the nearest NSR in the flight path at each end of the runway. In addition, noise measurements were also undertaken to determine road traffic from the R367.

LDEN is the 'day evening night' noise level that is anticipated to become the standard European index for environmental noise. LDEN is a measurement of noise over the course of an entire year. In order to ensure the index takes into account the increased sensitivity of the evening and night LDEN includes 5 and 10 dB penalties for these periods respectively.

Baseline Results: LDen Equivalent Calculations

Location	D	E	N	LDEN
N1 Unattended	53.8	66.2	42.3	**59.1**
N2 Unattended	56.9	54.3	54.3	**69.6**
N2 Attended	56.9	54.3	54.3	**69.6**
N3 Unattended	57.9	49.9	51.6	**55.7**
N4 Attended	69.1	70.4	61.3	**81.8**
N5 Attended	48.6	65.1	45.8	**71.5**
N6 Attended	47.6	49.9	45.2	**61.3**

In summary, the noise levels recorded at all locations are dominated or heavily influenced by road traffic noise from the existing N17 and R367 roads. High levels of calculated LDEN values ranging from 59.1 dB Lden to 71.5 db Lden were identified, however it must be noted that during this period only 1 aircraft pass by was recorded, otherwise all other levels were influenced solely by road traffic noise. Local road traffic noise in particular was dominant intermittent source at certain locations.

Ground Noise Sources:

Airport:

Air traffic movements through the airport require the utilisation of ground equipment on the apron and taxiway. There is insufficient data to allow for prediction of noise arising from airport transport facilities and apron ground noise sources.

Traffic management at the airport site includes speed restrictions, type of surfaces, car parking arrangements, vehicle access and queuing. Using measured free field noise data exclusive of low-level background noise, an SEL of 75dBA has been used to represent the noise from door closure event at 10 metres.

An assessment of the existing and predicted noise levels has shown that the impact on the receiving environment from this source is likely to be high and could be considered significant. However, this must be considered in the context of the character of the existing rural receiving environment and indeed, established policies for the ongoing development of regional airports.

Road Network:

The main noise impacts on the noise climate in the area are from localised road traffic; is from the existing level of traffic on the N17 and R367.

Quarrying: The impact of noise generated from quarrying operations in the townland of Barnalyra; namely CEMEX ROI, planning reference 09/690 and Brendan O Grady (QY48) depend on surface characteristics, wind direction and other meteorological conditions. Both quarries operate under planning controls. CEMEX ROI is required to submit details of noise monitoring reports to Mayo County Council. Two noise reports are required per annum.

Air Noise sources:

Knock Airport is not currently required to produce strategic noise maps under the END, based on the projections for the airport for air traffic movements, mapping is unlikely to be needed until 2030. As such mapping is not required.

An estimate of the noise levels at nearest noise sensitive receptors in the flight path of the runway 26 and 8 was undertaken by extrapolating measured SEL data. Using flight data obtained from the airport, and cross reference with measured noise level data from the airport flight tracking system allowed for the determination of the aircraft with the highest SEL. The aircraft with the highest SEL was identified as the Boeing 737-800 which had an SEL of 87dB on landing.

It must be noted that the location of one monitoring location (N3) was directly beneath the flight path and as such represents a worst-case exposure location for aircraft noise; other locations are likely to experience far lower levels of noise exposure from aircraft movement even with lateral noise emissions and overflight noise. The predictions were also based on the assumption that only one runway would be used. In reality it would be expected that some split in usage between the two runways would occur depending on the prevailing weather conditions. This would serve to further reduce the exposure of this location.

The nearest Noise Sensitive Receptor (NSR) to the proposed development is located approximately 250 metres to the north. At such a distance the worst-case sound propagation is in the range 48.0dB - 51.5dB for 2010 based on the calculations undertaken. Considering that the measured noise level at the nearby location N1 is 53.8dB LDay and that the calculations undertaken disregards the natural screening affect that would be naturally provided by the topography in the area, it can be said therefore that the impact of operational noise at nearest sensitive receptors would be low based on the baseline measurement taken.

4.6.3 Climatic Factors

4.6.3.1 Climate Change

Climate Change is recognised as the most serious and threatening global environmental problem. While natural variation in climate over time is normal, it is recognised that the rate of climate change is increasing as the emission of greenhouse gases into the atmosphere increases. The primary greenhouse gas is carbon dioxide CO^2 generated by the burning of fossil fuels. It is generally accepted that in order to reduce greenhouse gas emissions it is necessary to increase the use of energy from renewable sources.

The current strategy for the reduction in the use of fossil fuel and an increase in renewable energies stems from the Kyoto Protocol, an international agreement linked to the United Nations Framework Convention on Climate Change. The Kyoto Protocol sets binding targets for 37 industrialized countries and the European community for reducing greenhouse gas emissions. The targets amount to an average of five per cent against 1990 levels over the five-year period 2008-2012. In December 2012 the “Doha Amendment to the Kyoto Protocol” was adopted. A second commitment period was adopted, 1 January 2013 to 31 December 2020.

Specific baseline data on greenhouse gases is not available for Co. Mayo therefore National data is used as an indicative template for Mayo until specific data becomes available.

National baseline data is taken from the EPA publication Ireland's Greenhouse gas emissions in 2015. Figure 15 shows the contribution from each of the NCCS sectors.

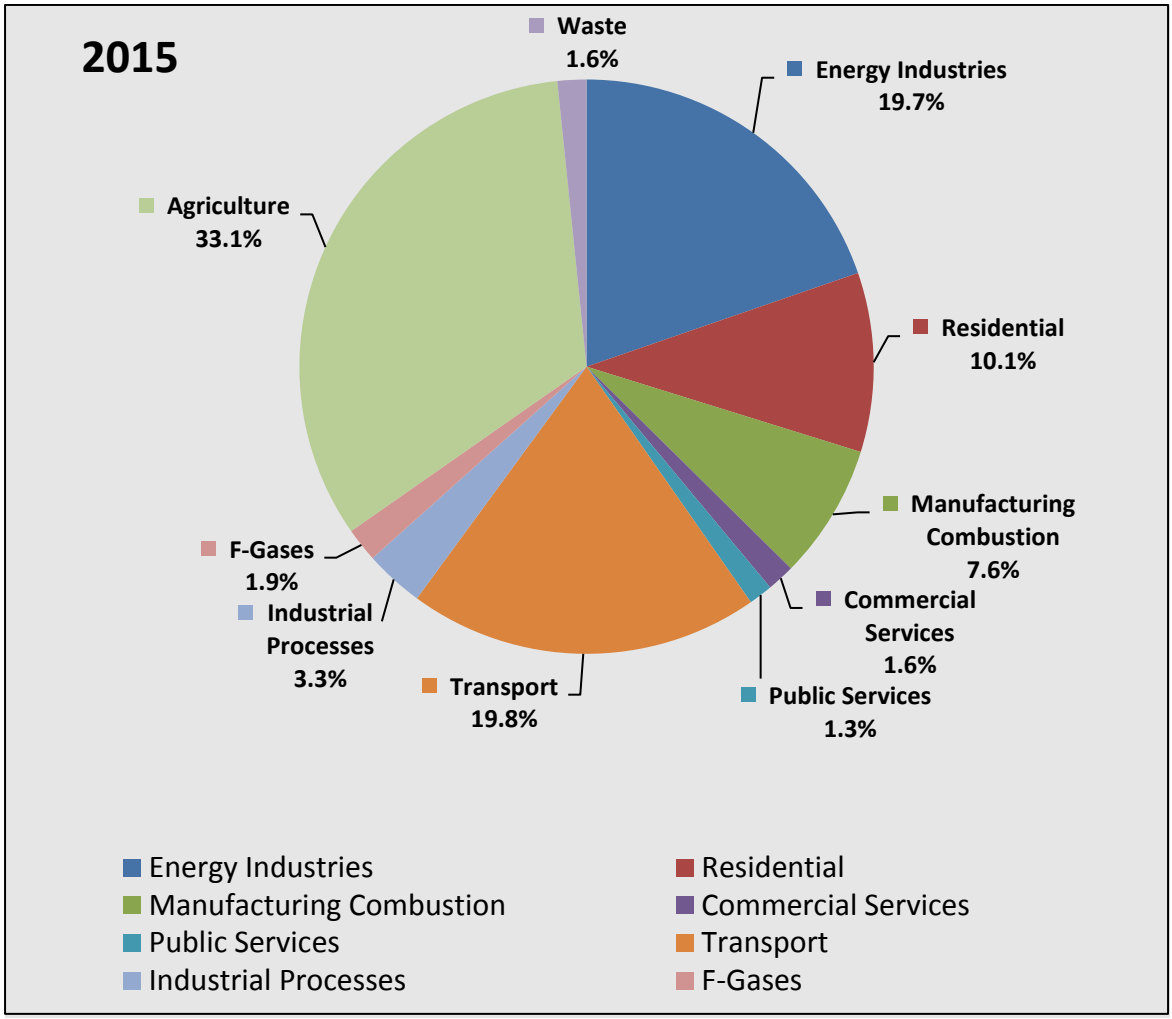


Figure 15Greenhouse Gas Emissions in 2015 by Sector

European Union Directive 2009/28/EC on the promotion of the use of energy from renewable sources establishes the basis for the achievement of the EU's 20% renewable energy target by 2020. Under the Directive, each Member State has a binding renewable energy target, which will contribute to the achievement of the overall EU goal. Apart from a sub-target of a minimum of 10% in the transport sector that applies to all Member States, there is flexibility for each country to choose how to achieve their individual target across the sectors. Ireland's overall target is to achieve 20% of energy from renewable sources by 2020[2].

[2] National Renewable Energy Action Plan 2010 DCENR

The National Climate Strategy 2007-2012 builds on Ireland's first Climate Change Strategy (2000) and its purpose is to limit the growth in greenhouse gas emissions. The National Climate Change Strategy 2007-2012 sets out ways to achieve national targets for the period 2008-2012 and to identifies areas in which further measures are being researched and developed to meet our 2020 commitment. The targets will be achieved through several means including harnessing more renewable energy and using energy more efficiently.

The Climate Change and Low Carbon Development Act 2015 now provides a statutory,

overarching basis for climate change in Ireland. It provides structures to transition to a low

carbon economy through the following:

• a national mitigation plan (to lower Ireland's level of greenhouse emissions);

• a national adaptation framework (to provide for responses to changes caused by climate change); and

• tailored sectoral plans (to specify the adaptation measures to be taken by each Government ministry).

The EPA has identified a number of indicators and trends pointing to climate change with the clearest trend evident in the temperature records which show a mean temperature increase of 0.7o C between 1890 and 2008, i.e. an increase of 0.06o C per decade. The increase was 0.4o C during the period 1980-2008, i.e. equivalent to 0.14o C per decade.

Other Indicators are:

- Six of the ten warmest years in Ireland have occurred since 1990.
- A reduction in the number of frost days and shortening of frost season length.
- An increase in annual rainfall in northern and western areas with decreases or small increases in the south and east.

These changes are reflected in Ireland's natural environment with an increase in the growing season and with greater number of animals suited to warmer temperatures being evident in Ireland and its surrounding waters.

Climate Change impacts are projected to increase in the coming decades and during the rest of this century. Uncertainties remain in relation to the scale and extent of these impacts, particularly during the second half of the century. The greatest uncertainly lies in how effective global actions will be in reducing greenhouse gas emissions.

4.6.4 Flooding

'The Planning System and Flood Risk Management Guidelines 2009' were issued by the Minister of the Environment, Heritage and Local Government under Section 28 of the Planning and Development Act 2000, as amended. The Guidelines introduce comprehensive mechanisms, such as Strategic Flood Risk Management (SFRA), for the incorporation of flood risk identification, assessment and management into the planning process. Implementation of the Guidelines is achieved through actions at national, regional, local and site-specific levels.

The main risk of flooding in the study area is from the Pluvial – Extreme category. Pluvial flooding can be defined as flooding which results from rainfall generated overland flow and / or ponding which may occur during or immediately after intense rainfall events, before the runoff enters any water course or sewer. A Strategic Flood Risk Assessment was carried out and the results of which are set out in Appendix 2.

4.6.5Existing Environmental Problems relating to Air Quality and Climate Factors

Air quality can be affected by the introduction of pollutants which can chemically react in the atmosphere to produce secondary pollutants such as acid rain or ozone. One of the major features of air pollution is the trans-boundary dispersion of pollutants. Therefore, it important to consider impacts both on the local and wider environment.

The primary environmental threats with regard to air quality are detailed below: (1) road traffic (2) heat generation, (3) fugitive emissions from extractive industries.

Road traffic emissions: Motor vehicles are a major source of emissions of carbon monoxide (CO), benzene (C6H6), nitrogen oxide (NO) and nitrogen dioxide (NO2). Concentration levels of these air pollutants are below limit values in the air quality standards; however, road traffic emissions can directly affect human health, adversely affect the environment and are a major source of secondary pollutants such as tropospheric ozone. The pollutant emissions emanating from vehicular sources are also those to which the public may be most readily exposed, and they present a considerable risk in areas subject to heavy traffic [1].

The problem of controlling emission from vehicles is complex and requires various control measures as motor vehicles represent a very large number of small sources, each of the sources are mobile and each source emits different amounts and proportions of pollutants according to how the vehicle is used. Growth in passenger numbers will give rise to increased motor vehicle emissions in the area.

Emissions from Power and Heat Generation: The principal pollutants from power plants are those that arise from the combustion of fuel, namely sulphur dioxide (So2), carbon dioxide (C02) and nitrogen oxide (NO). The growth in demand for electricity on a national basis has involved the need for more energy generating capacity using fossil fuels. The emission from power plants depend on the fuels used, methods used to generate electricity and pollution abatement equipment. A high reliance on fossil fuel for domestic and commercial space heating in the county is compounded by the lack of district heating networks as well as combined heat and power plants. Natural gas is the least polluting of all the fossil fuels used for energy production, emitting less SO2, CO2 and NOx per unit of energy than any other fossil fuel.

Emissions from commercial/industrial activities: The impact of fugitive dust emissions generated from quarrying operations in the townland of Barnalyra; namely CEMEX ROI, planning reference 09/690 and Brendan O Grady (QY48) depend on surface characteristics, wind direction, wind speed and other meteorological conditions such as precipitation. Dust emissions could potentially have implications for the level of dust generation on roads, car parks and other hard standing areas. Dust from quarry sites can affect air quality, although the severity will depend on factors like the local microclimate conditions, the concentration of dust particles in the ambient air, the size of the dust particles and their chemistry. Both quarries operate under planning controls.

Emissions from aircraft: There is an established link between the rise in greenhouse gases and air travel. Flights from Ireland West Airport Knock will result in airborne greenhouse gas and other air pollutant emissions. Ireland has committed to reducing greenhouse gases under the Kyoto Protocol. The National Climate Change Strategy (2000) and 2007-2012 sets out measures to achieve these reductions. Currently aviation emissions are not included in national emissions inventories for compliance with Kyoto Protocol requirements for greenhouse gas reductions [1]

Air Borne Radiation: is a natural air pollutant and occurs primarily as a result of cosmic radiation and the decay of radionuclide in soils and rocks. Radon is a Class-1 carcinogen. The level of radiation depends on where you live, degree of insulation in home and air travel/occupation. A significant portion of count Mayo has radon levels above the reference. The carcinogenic gas has direct links to lung cancer and attributes for 10-15 per cent of all lung cancer cases nationally. In a recent study by the Radiological Institute of Ireland four homes in Mayo had more than four times the acceptable level with readings in excess of 800 becquerels per cubic metre (Bq/m3) and were found in Charlestown, Castlebar, Claremorris and Ballinrobe. North Mayo is one of the worst affected areas with the south and east of the county experiencing levels well above acceptable levels, however the west coastline of the county has far lower levels of the toxic gas. Mayo is regarded as a high-risk area according to the Radiological Protection Institute of Ireland. Ballina town and the surrounding area is particularly at risk with a high level of the gas in the town itself and for a number of surrounding miles. Radon has no smell, colour or taste and can only be detected using special detectors. Long-term exposure to radon increases the risk of lung cancer.)

Noise: Noise levels were influenced primarily by road traffic noise. Local road traffic noise in particular is dominant intermittent source at certain locations.

Climatic Factors

Climate Change: The increasing rate of climate change is intensifying existing environmental problems arising from more extreme and unstable weather conditions.

Flooding: A Strategic Flood Risk Assessment was carried out for the SEA Area. The existing flooding events are mainly from surface water runoff. The Flood Risk Management Guidelines indicates that type of development associated with airports are classified as fit for 'highly vulnerable development' but are considered appropriate at this location. However, it has been noted that surface water runoff from the airport runway can cause flooding and hence may warrant further investigation.

4.6.6 Evolution of Air and Climatic Factors in the absence of the Planning Scheme for Ireland West Airport Knock

Air Quality

The evolution of air quality in the presence of a local area plan is dependent on strategies engaged however the application of a plan can provide for the maintenance of good air quality in the area. The impacts of the plan will depend on a number of variables such as the locations of developments, the

type and scale of projects, planning controls and environmental authorisations for such developments. It is important that a policy of energy efficiency is implemented in conjunction with the plan in order to conserve natural resources of fuel and subsequently maintain good air quality status.

The main influences on air quality in the study area are traffic emissions from vehicles using the facilities at the airport and the N17 national road and the quarries to the west of the airport. The estimated peak hour vehicle movements for the carpark and airport in general will increase (from 2010 level) by approximately 300 by 2025. These vehicle movements will result in additional pollutant generation (SO2, NOx. CO, PM10 and VOCs) [1] The potential development of the Ireland West Airport Knock complex will result in an increase in traffic and energy related emissions due to the anticipated increase of traffic and increased energy requirements in the area. Without SEA there is a possibility that traffic queues and slower driving conditions entering the airport would increase the level of associated pollutants however adequate road network capacity and the rural nature of the location indicate that the potential impact of traffic will be minimal.

Air quality in the study area in the absence of a SEA would involve a continued reliance on fossil fuels for heat and power requirements, hence the continued direct and indirect emissions from fossil fuel combustion and the extraction of fossil fuels. Due to the trans-boundary nature air pollution it is necessary to consider both local and accumulative impacts on the wider environment. Reliance on imported fossil fuel heat requires the transportation of such fuel into the area. This places additional stress on air quality due to increased transport requirements.

In the absence of the SEA, the primary objective for air quality in County Mayo is to ensure compliance with the Clean Air for Europe (CAFÉ) Directive (2008/50/EC) which was published in May 2008. It envisaged that compliance with this directive will be achieved as emission levels in County Mayo are well below the specified limit values for the CAFE directive.

There is an established link between the rise in greenhouse gases and air travel. The most likely scenario for the evolution of future air quality is that the effect of increased aircraft movements will be offset by reductions in jet engine pollutant emissions this would mean that air quality will remain essentially unchanged in the locality but will have an accumulative impact with regard to national air quality and climate change data. Improvements in passenger facilities at Ireland West Airport Knock Airport may reduce any tendency towards increased passenger transport to Dublin or Shannon Airports but ultimately the effects of climate change will mean that more extreme weather patterns and this may affect the operation and management of Ireland West Airport Knock in the future.

The Department of Environment, Community and Local Government (DoECLG) is the lead department responsible for ensuring that Ireland meets its Kyoto Protocol commitments. Most of the strategies for achieving these commitments are set out in the National Climate Change Strategy 2007-2012. The strategy for reducing emissions will be shared across all sectors but the main focus will be on transport, residential, industry, electricity production, the public sector and waste.

The conclusion from the latest environmental assessment carried out at Ireland West Airport Knock is that the air quality is within current air quality standards and that future intensification of operations is unlikely to have a significant impact.

Noise
Under a 'do-nothing' scenario, noise levels within the surrounding environment would remain nominally unchanged with the exception of natural increases in road traffic noise at receptors along the N17.

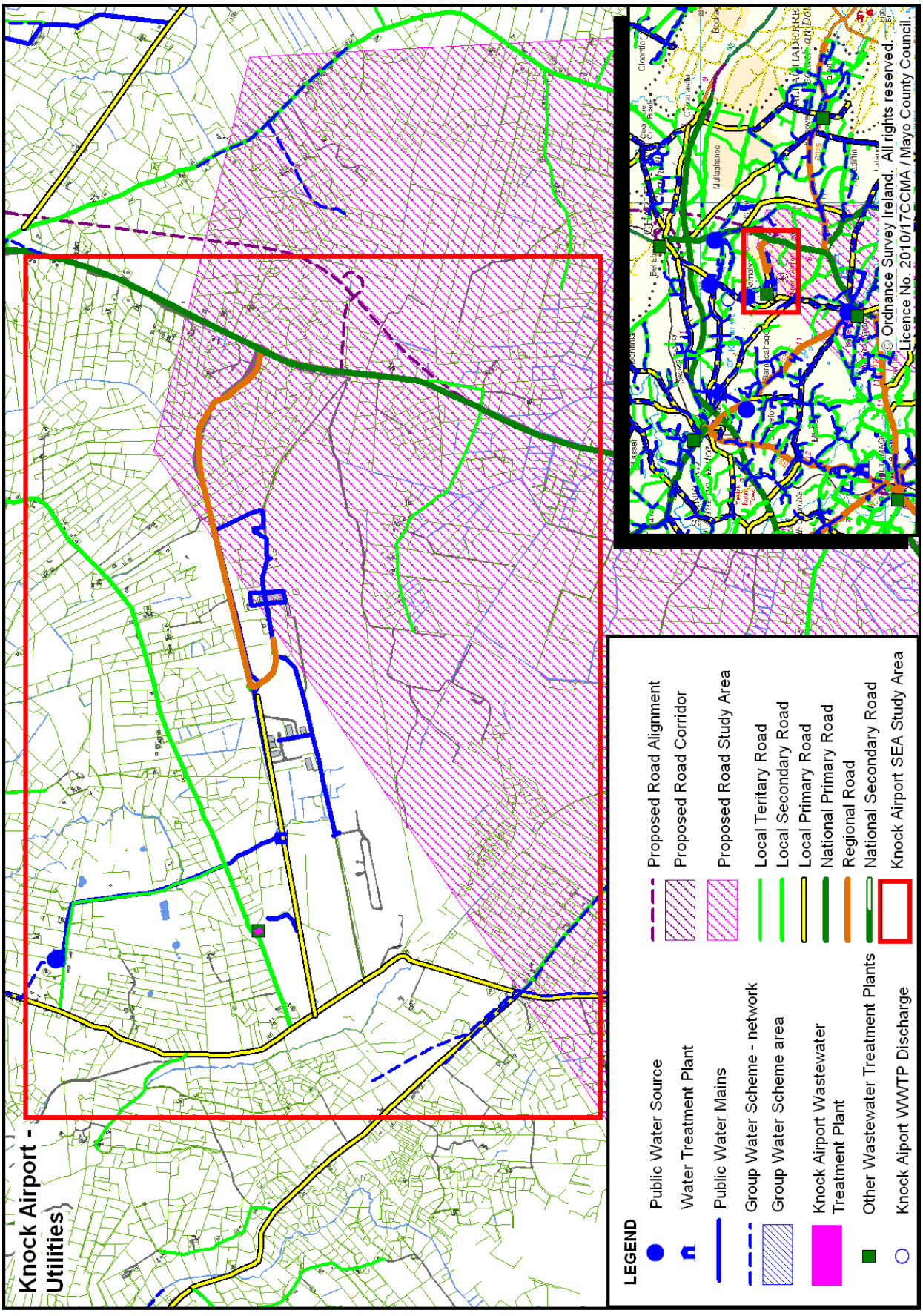
The traffic impact assessment completed by RPS identified that traffic volumes on the adjacent N17 and R367 road network will increase when aided by structures such as extended car parking facilities and upgrading of the road infrastructure. A direct result of such increases in road traffic volumes will be an associated increase in road traffic noise generation.

In summary environmental noise can be affected by:

- increases in aircraft traffic especially flights using larger aircraft
- increased urbanisation of airport neighbourhoods
- increased public awareness of environmental noise problems

Climatic Factors
Under a 'do nothing scenario' development of the airport would happen in a haphazard manner without any definite proposals for energy conservation and the use of renewable energy technologies. Surface water management would not occur in a planned manner leading to possible problems related to flooding.

Figure 16 Infrastructure at Ireland West Airport Knock



4.7 Material Assets

4.7.1 Introduction

It is considered that the relevant material assets in the context of the Airport are the airport, roads and transportation and other utility related infrastructure within the area.

4.7.2 Roads and Transportation Infrastructure

4.7.2.1 Roads

Access to the Planning Scheme area is from the National Primary Route (N17) via the R376 Regional Road. The N17 links the Gateways of Galway to Sligo and also joins the National Primary Route N5 Dublin to Westport approximately 7km to the North of the Airport.

Traffic Counts at the Junction of the N17 and the R376 in 2008 recorded 3558 Annual Average Daily Traffic Counts (AADT), with the N17 recording 6614 AADT in 2018. The National Roads Authority has plans to Re-align the N17, bypassing Charlestown. A number of route options are currently been considered which will result in improved access to the area.

The R376 Regional Road runs through the centre of the Planning Scheme area. To the North of the Regional Road are undeveloped lands, whilst the lands to the South contain the Airport Campus. The Airport is accessed off the R376 by a roundabout with a spur leading to the Airport. Passenger circulation is through the existing car park. The situation is not ideal as the drop off and pick up areas are not separate from the airport parking area.

4.7.3 Airport

The original passenger terminal was built in 1986 and is located north of the runway directly west of the current passenger apron. A 3000m^2 extension to the terminal building was opened in 2009 which has resulted in creating more circulation space for passengers, new security screening areas, extended check in facilities, an increased departure lounge space as well as new retail, catering and other facilities.

The existing runway (26-08 runway) is 2340 metres long and 45 metres wide. The runway has turning circles, 80 metres in diameter at each end, symmetrical about the runway centreline. The runway strip is a defined area which includes the runway and stopway and is intended to reduce the risk of damage to aircraft running off a runway and to protect aircraft during take-off and landing operations. In May 2018 the Department of Transport, Tourism and Sport announced €2.7 million for critical upgrades for safety and security projects. It is expected the works will be complete in two years. Further funding was announced by the Government for a Pavement Overlay project with a value of €11.2M and 75% of will be funded by Government across 2018 and 2019.

Table 11 Declared distances of the runway

	TORA (Take Off Run Available) (m)	ASDA (Accelerate Stop distance Available) (m)	TODA (Take Off Distance Available) (m)	LDA (Landing Distance Available) (m)
Runway 26	2270	2300	2300	2270
Runway 8	2240	2300	2300	2087

The current runway strip is 300 metres wide is in compliance with the International Civil Aviation Organisations (ICAO) recommendations for CAT 2 runways. No fixed objects except for visual aids required for navigation purposes as set out by the ICAO are permitted within the runway strip.

The existing runway is sufficient to cater for planned and future aircraft requirements, but it may be necessary to consider an extension of the runway to 2,600m to cater for a wider range of aircraft.

4.7.4Energy

The airport is supplied by 10 kV from the Charlestown 38kV/MV station via an outlet located at Charlestown (Airport Outlet). Standby provisions from this outlet are located at Swinford and Tubercurry. Electricity feeds to a 600kVA substation located on the airport property which supplies the airport and adjoining industrial park with power.

However, EirGrid has confirmed the start and end points for the North Connacht Project, a new electricity line that will connect local renewable energy to the national grid and reinforce the regional electricity system.

A series of economic, socio-economic, environmental and technical network studies have concluded that the line should run between the electricity substations at Moy near Ballina in county Mayo, and Tonroe, near Ballaghadreen, in Co. Roscommon. The other option was a circuit between Moy and Srananagh in Co. Sligo.

During 2018, EirGrid carried out the studies and consulted with the public and stakeholders in Mayo, Sligo and Roscommon. On the basis of these studies and feedback received, Moy and Tonroe proved the best-performing start and end points for the proposed new line. This 110kV line can run overhead or underground. If an overhead line is used, the majority of the distance would be carried on twin pole sets.

4.7.5 Wastewater

Knock Airport WWTP was commissioned in February 2004 to serve the airport now known as Ireland West Airport Knock and the adjacent industrial park with a design population equivalent PE of 700 to the standards required by the Urban Wastewater Treatment Regulations 2001 i.e. BOD 25mg/L, COD 125 mg/L and SS 35 mg/L.

The wastewater treatment works at Ireland West Airport Knock consists of a WWTP with an associated collection network of foul sewers that serve the Airport Terminal and Industrial Park Area adjacent to the Airport Access Road. There is currently 1 No. pumping station located at the eastern end of the

agglomeration adjacent to the Airport Access Road R-376-0 but there are no sewer connections to this pumping station at present.

Final effluent is discharged through a 100m rising main outfall pipe to the Sonnagh River in the townland of Killeen a distance of 2,700 metres from the treatment works. The Sonnagh River is a tributary of the River Moy. Sludge storage is provided at the treatment plant works. Desludging is carried out by suction tanker as required and is taken to the Swinford Treatment Plant for dewatering.

4.7.6 Drinking Water

The majority of Mayo County Council's Public Water Supplies and Group Water Schemes are sourced from surface waters i.e. lakes, which together with an extensive system of rivers and streams, sustain highly valuable fishery resources. The water quality of our lakes, rivers and aquifers must therefore be maintained to the highest possible standards.

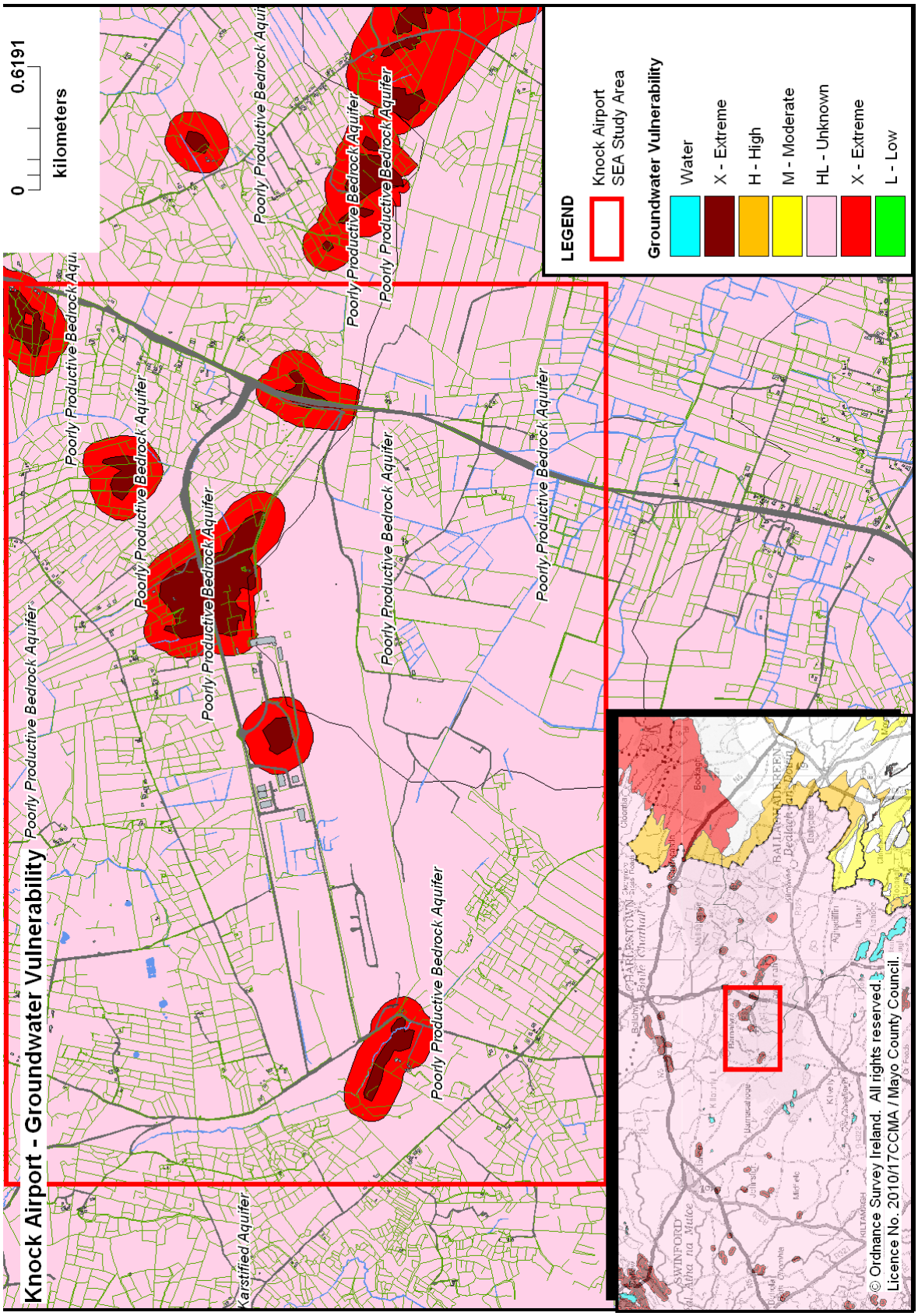
Drinking Water Regulations 2014 EU Policy- Drinking Water (80/788/EEC), The European Communities (Drinking Water) (No. 2) Regulations 2007 (S.I. 278 of 2007) (the Regulations) fully transpose and implement the EU Council Directive 98/83/EC on the quality of water intended for human consumption. They aim to protect human health from adverse effects of any contamination of water intended for human consumption or use in food and drink manufacture by ensuring that it is wholesome and clean.

The Drinking Water Regulations prescribe 48 parametric values which are classified as being either microbiological, chemical or indicator parameters. Furthermore, the Regulations outline two monitoring categories, Check monitoring and Audit monitoring. The purpose of Check monitoring is to provide information on the organoleptic and microbiological quality of the water supplied for human consumption, as well as information on the effectiveness of drinking-water treatment. The purpose of Audit monitoring is to provide the information necessary to determine whether or not all the standards specified in Part I of the Schedule to the Regulations are being complied with.

The EPA is the supervisory authority for Public Drinking Water supplies. Public water suppliers (Sanitary Authorities) are required to notify the EPA of breaches of drinking water standards and comply with any directions given by the EPA. Sanitary Authorities have similar powers in relation to private water supplies (i.e. group water schemes). The Health Service Executive was also given a statutory role in relation to the protection of human health and must be consulted both by the Sanitary Authority and the EPA where there is a potential risk to human health arising from a problem with a Drinking Water supply. The results for the compliance monitoring are sent to the Environmental Protection Agency each year for the Annual Report on Drinking Water Quality. Mayo County Council is responsible for 25 Public Water Supplies (PWS) serving a population of 78,021 (EPA, 2009).

Knock Airport PWS is sourced from a spring, which is located in a disused glaciofluvial sand and gravel quarry. The source is located in the townland of Kilgarriff known locally as 'Harringtons Well' (297475 N, 144869 E). This is situated in hydrometric area 34. The Groundwater body code is IE_WE_G_0064. The aquifer beneath is a karstified regionally important aquifer (Rkc). The Groundwater vulnerability map for this area shows high to low vulnerability (but the Geological Study of Ireland (GSI) maps state only an interim study took place).

Figure 17 Ground Water Vulnerability Map



Groundwater is an important natural resource which supplies some 20-25% of drinking water in Ireland. Groundwater in Ireland is protected under European Community and national legislation, and local authorities and the Environmental Protection Agency (EPA) are responsible for enforcing it.

A Groundwater Protection Scheme aims to maintain the quantity and quality of groundwater, and in some cases improve it, by applying a risk assessment-based approach to groundwater protection and sustainable development. In this way it helps public authorities to meet their responsibility to protect groundwater. This would include planning authorities which have a major function in the development and control of land use and the built environment.

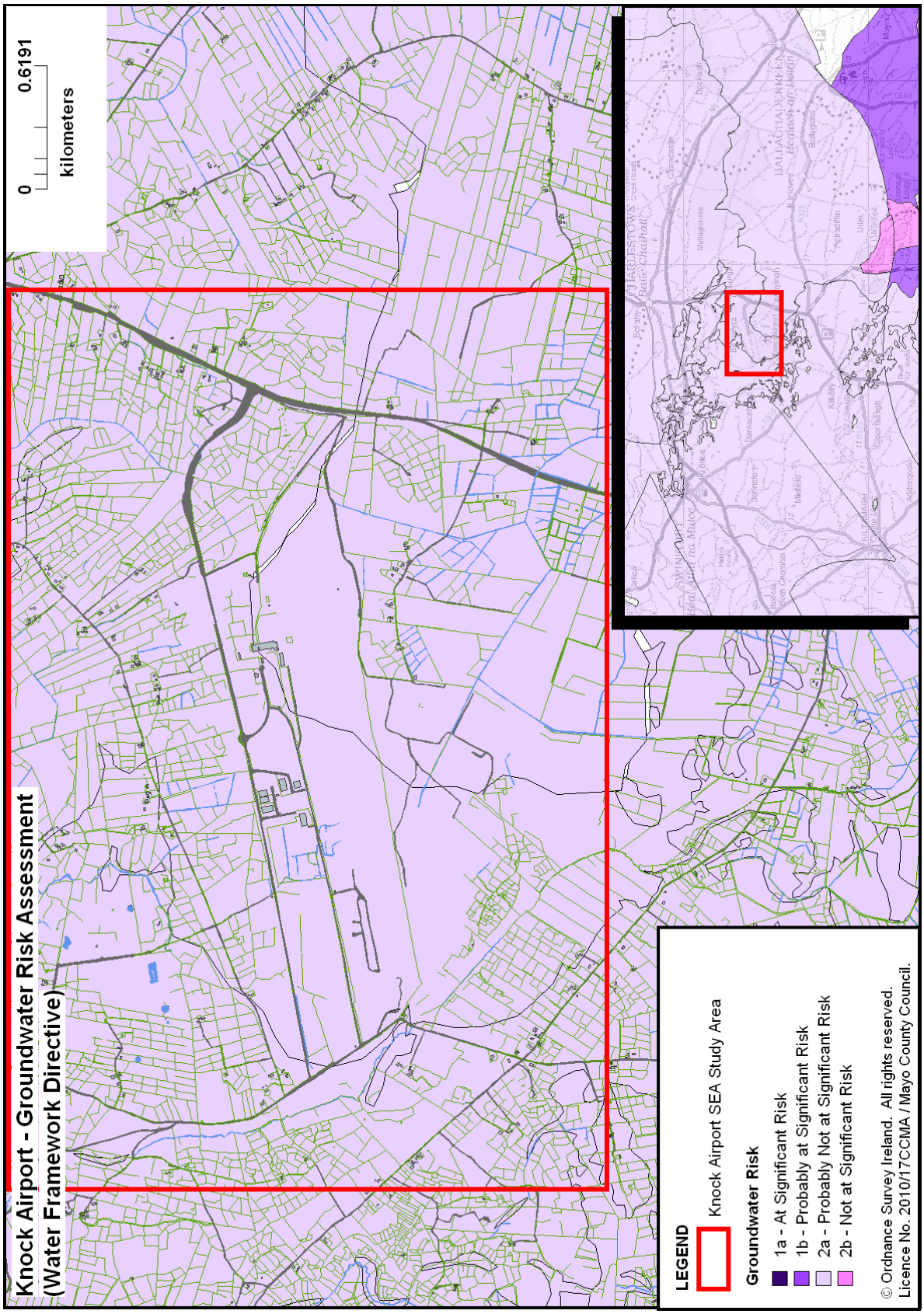
Two main components are integrated to produce a Groundwater Protection Scheme: (a) land surface zoning; and (b) groundwater protection responses for potentially polluting activities. The land surface zoning is presented on a Groundwater Protection Map which delineates land areas in terms of groundwater vulnerability to pollution and groundwater potential and is compiled by combining an Aquifer Map and a Groundwater Vulnerability Map. These, in turn, are derived from a series of primary maps: bedrock and subsoil geology, depth to bedrock, and hydrogeological data.

Groundwater protection responses for the different zones indicate the acceptability of a particular activity with respect to the potential hazard, aquifer category or source protection area, and groundwater vulnerability. The responses outline the design and construction conditions and investigation requirements which may be appropriate.

A scheme can also be used pro-actively: for example, to identify suitable sites for potentially polluting developments by avoiding, where possible, the main aquifers and vulnerable areas; or to locate water supply sources by identifying the best aquifers and avoiding the most vulnerable areas.

As part of the Water Framework Directive's Groundwater Monitoring Programme, given the location of the Planning Scheme site is in the category at risk, it was found that the groundwater status is good.

Figure 18 Ground Water Risk Assessment (WFD)



The PWS supplies Knock West Airport with approximately 40m^3 of treated water per day (EPA, 2011). Chlorination is the only form of treatment at this plant. Monitoring of the treated water is carried out monthly on the network.

The Cloonlyon private Group Water Scheme (GWS) (supplying 50 persons with a volume of 20 m^3/day) is also fed from this spring and another GWS (supplying 3 houses) is supplied from a stream, which originates from this spring source.

However, the long-term proposal for water supply at Ireland West Airport will either involve the extension of the Lough Mask Regional Water Supply Scheme from Knock Village or the provision of supply from the proposed North East Mayo Regional Scheme with its source at Lough Conn.

The Geological Survey of Ireland (GSI) Groundwater Vulnerability and Groundwater Resource Protection Zone maps. The overall aim of a scheme is to preserve the quality of groundwater, particularly for abstraction purposes, for the benefit of present and future generations.

4.7.7 Waste Management

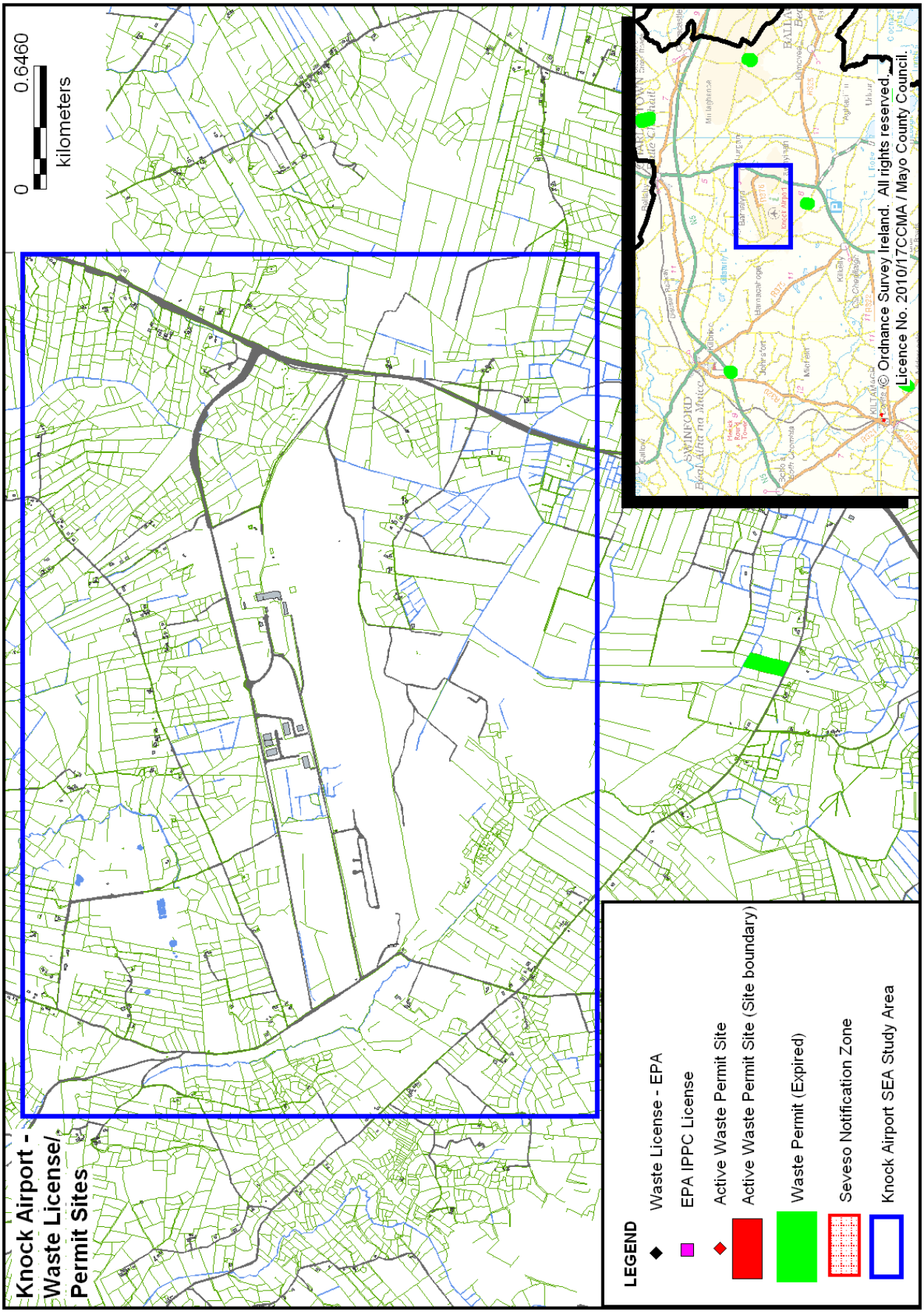
County Mayo forms part of the Connaught waste management region. Mayo County Council is the lead and nominated authority in the Region. The current plan 'Connacht Ulster Waste Management Plan 2015-2021' details the regions integrated waste management approach and policies with specific targets that are to be achieved by 2021. The targets are derived from the EU waste Hierarchy and require that of waste arising, 50% is recycled by 2021. 1% reduction per annum generated per capita over the period of the plan, achieving a recycling rate of 50% of managed municipal waste by 2020 and to reduce it to 0% of the direct disposal of unprocessed residual municipal waste to landfill in favour of high-volume pre-treatment process and indigenous recovery practices.

There are no waste management facilities within the study area. All waste produced has to be transported out of the area. Most waste streams generated at the campus can be managed through permitted waste collectors who are authorised to collect in Mayo and to transfer wastes to specific authorised facilities inside and outside the county. Airport International catering wastes are classified as Category 1 animal by products and are to be managed in accordance with the requirements of the Department of agriculture and food.

4.7.8 Telecommunications

Mayo County Council has provided a Metropolitan Area Networks (MANs) around the airport site offering a fast and efficient telecommunications network within the LAP area. MANs is a high capacity fibre optic system which is future proofed and offers virtually limitless capacity in terms of broadband and other telecommunication systems.

Figure 19 Waste License and Permit Sites



4.7.8 Existing Environmental Problems relating to Material Assets

4.7.8.1 Roads and Transportation Infrastructure

The primary environmental issues relating to roads and transportation include emissions from vehicles using the site and vehicles using the N17 National Road to the east of the site. Pollutants from road traffic may pose a threat to air and noise quality and human health. Furthermore, emissions of nitrogen oxide, carbon monoxide, particulates and hydrocarbons as a result of landing and take-off of aircraft could have a discernible impact on the surrounding environment. There is an established link between the rise in greenhouse gases and air travel. Flights from Ireland West Airport Knock will result in airborne as well as the aforementioned air pollutants.

4.7.8.2 Energy

The space heating and electricity demands in the plan area involve the emission of pollutants associated with the combustion of fossil fuels. The airport heating and stand by power systems are fossil fuel powered. The emission of CO2, Carbon monoxide and sulphur dioxide from natural gas fired boilers and generators may cause potential threats to the environment.

4.7.8.3 Wastewater

Mayo County Council has made an application to the Environmental Protection Agency (EPA) for a Waste Water Discharge Licence, for the Ireland West Airport Knock Waste Water Treatment Plant (WWTP) and Agglomeration, in compliance with the Waste Water Discharge (Authorisation) Regulations 2007 (S.I. No. 684 of 2007). There are no existing environmental issues associated with the WWTP in the Planning Scheme area.

4.7.8.4 Drinking Water

The Ireland West Airport Knock water supply was upgraded in 2007 with the construction of a new booster station with 40m^3 storage and chlorination facilities to give treated water to the Airport and its environs. The upgrade included for the protection of the water supply source, which is a well located in the townland of Kilgarrif. There are no existing environmental problems associated with the water supply and subsequently the drinking water in the Ireland West Airport Knock area.

There have been no exceedances on the drinking water tested at Knock Airport in 2018. From the Drinking water data taken to date, all the results are compliant.

Vulnerability of Ground Water to pollution is linked to soil permeability and depth i.e. the thicker and less permeable the overlying subsoil layer the lower the risk of pollution. GW vulnerability zones are being mapped currently for Mayo by the Geological Survey of Ireland. Source protection zones have been established. These zones around GW sources such as wells, boreholes and springs used for public drinking water supply, which show the risk of contamination form any activities that might cause pollution in the area i.e. the closer the activity the higher the risk.

4.7.8.5 Waste Management

Without any waste management facilities located in of close to the study area, all waste produce is transported out of the area to waste management facilities.

4.7.9 Evolution of Material assets in the Absence of a Planning Scheme for Ireland West Airport Knock

"The Ireland West Airport Knock Planning Scheme provides a policy framework to guide and manage the future growth and sustainable development of Ireland West Airport Knock. It sets out objectives for the zoning of land for particular uses and provides the framework against which planning applications will be assessed. The overall strategy of the Planning Scheme has regard to national, regional and county policy and guidance, as well as the aspirations and views of the local community".

In the absence of a Planning Scheme for Ireland West Airport Knock SDZ the existing policies and objectives of the Mayo County Development Plan 2014-2020 relating specifically to Ireland West Airport Knock would guide the planning and development of the airport. Accordingly, policies and objectives of the County Plan have been formulated having regard to the existing situation on the ground and future projections for Roads, Transportation, Energy, Waste Water and Drinking Water within the Ireland West Airport Knock jurisdiction.

Roads and Transportation Infrastructure

The absence of a Planning scheme for the Airport region could result in ad hoc incompatible development at and around the Airport which could compromise the day to day operations of the Airport, which would be unsustainable and against the principles of proper planning and development. Ireland West Airport Knock is a fundamental facet within the County's transportation infrastructure and the absence of a Planning Scheme could undermine the carrying out of transport and infrastructural development aims and objectives. The policies and objectives set out in the Planning Scheme should guide the development of a high quality, sustainable and integrated transportation system embracing the road, rail, and air transport sectors in an attempt to achieve a more balanced sustainable transport system within the Planning Scheme area and throughout the county and region. The absence of a Planning Scheme would hinder the development of Ireland West Airport Knock as a transportation asset within the county and furthermore strategic road and rail corridors as critical elements to the intra/inter regional linkages.

Energy

The absence of a Planning Scheme for the Airport region could result in the depletion of energy supplies in the area in an unacceptable manner both environmentally and sustainably due to the lack of strategic local guidance relating to Energy infrastructure at the Airport. The Mayo County Development Plan 2014-2020 aims to develop high quality Energy Infrastructure throughout the county and furthermore to ensure that the energy supply and distribution throughout Mayo is expanded and upgraded sufficiently to enable economic, enterprise and other developments to locate in the County. A lack of strategic guidance at local level at Ireland West Airport Knock could compromise the ability of these Development aims to come to fruition.

Waste Water
In the absence of the Ireland West Airport Knock Planning Scheme, development in this area would potentially occur with no specific strategic plan for the Airport region only the broad policies and objectives set out in the Mayo County Development Plan 2014-2020 and other hierarchical plans for guidance. Such a subjective approach could lead to over development which would result in overloading of the wastewater treatment system and incompatible development not conducive to groundwater and surface water protection and enhancement. A Planning Scheme would guide sustainable development wile concurrently observing the protection of groundwater and ensuring adequate protection of same.

Drinking Water
As with Waste Water above the absence of a Planning Scheme for the Airport region could result in potential environmental risks to ground water and subsequently drinking water. Furthermore, development in the area could occur on an ad-hoc basis which could result in over development in the area and over consumption of a depleting water supply. A Planning Scheme would guide the sustainable development of the area and also ensuring the protection and maintenance of the good water body which provides the water supply to the area and furthermore, the restoration of the moderate and poor water bodies through a proper sustainable plan led approach.

The Water Framework Directive aims to achieve high status by 2027. In the absence of the Planning Scheme perhaps there may be less awareness of possible impacts in combination with location of our drinking water sources. The Planning Scheme will assist in decision-making on the location, nature and control of developments and activities in order to protect surface waters and groundwater. The use of this strategy will help to ensure that due regard is taken to maintain the beneficial use of these waters.

Waste Management
In the absence of Ireland West Airport Knock Planning Scheme, the Connaught Waste Management Plan will continue to drive waste management in the county. Constantly evolving environmental legislation assists with an integrated approach to achieving targets in waste management. Greater awareness due to successful local and national campaigns, greater visibility of enforcement through multi-agency road check points and media coverage assist with advancing towards achieving 'Connacht- Ulster Waste Management Plan 2015-2021'.

4.8 Cultural Heritage

4.8.1 Introduction

Heritage, by definition, means inherited properties, inherited characteristics and anything transmitted by past ages and ancestors. It covers everything, from objects and buildings to the environment. Cultural heritage includes physical buildings, structures and objects complete or in part, which have been left on the landscape by previous and indeed current generations. Mayo's heritage is a unique resource which is fundamental to the cultural identity of the county and the quality of life of its citizens- it is central to how we see ourselves and to our identity as individuals and communities.

Historic buildings can define a region's localities and communities and can become a focus of community identity and pride. An historic church or park, for example, can help define a neighbourhood and create a sense of local cohesion.

4.8.2 Archaeological Heritage

Heritage, by definition, means inherited properties, inherited characteristics and anything transmitted by past ages and ancestors. It covers everything, from objects and buildings to the environment. Cultural heritage includes physical buildings, structures and objects complete or in part, which have been left on the landscape by previous and indeed current generations. The heritage of Co. Mayo is a unique resource which is fundamental to the cultural identity of the county and the quality of life of its citizens. Our Heritage is central to how we see ourselves and to our identity as individuals and communities. For example, historic buildings can become a focus of community identity and pride.

The archaeological heritage includes National Monuments in the ownership or guardianship of the State, National Monuments that are the subject of Preservation Orders, archaeological and architectural monuments and sites listed in the Record of Monuments and Places (RMP) and the Register of Historic Monuments, zones of archaeological potential in Historic Towns; the underwater archaeological heritage, including Historic Wrecks; unknown and unrecorded archaeological sites (including subsurface elements with no visible surface remains); potential sites located in the vicinity of large complexes of sites or monuments, present or former wetlands, unenclosed land, rivers or lakes, or inter-tidal zones.

Monuments can be described as any artificial or partly artificial building structure, or erection. Monuments protected under the National Monuments Acts 1930-2004 include places and artefacts associated with commercial, cultural, economic, industrial, military, religious or social activity.

4.8.3 The Existing Environment

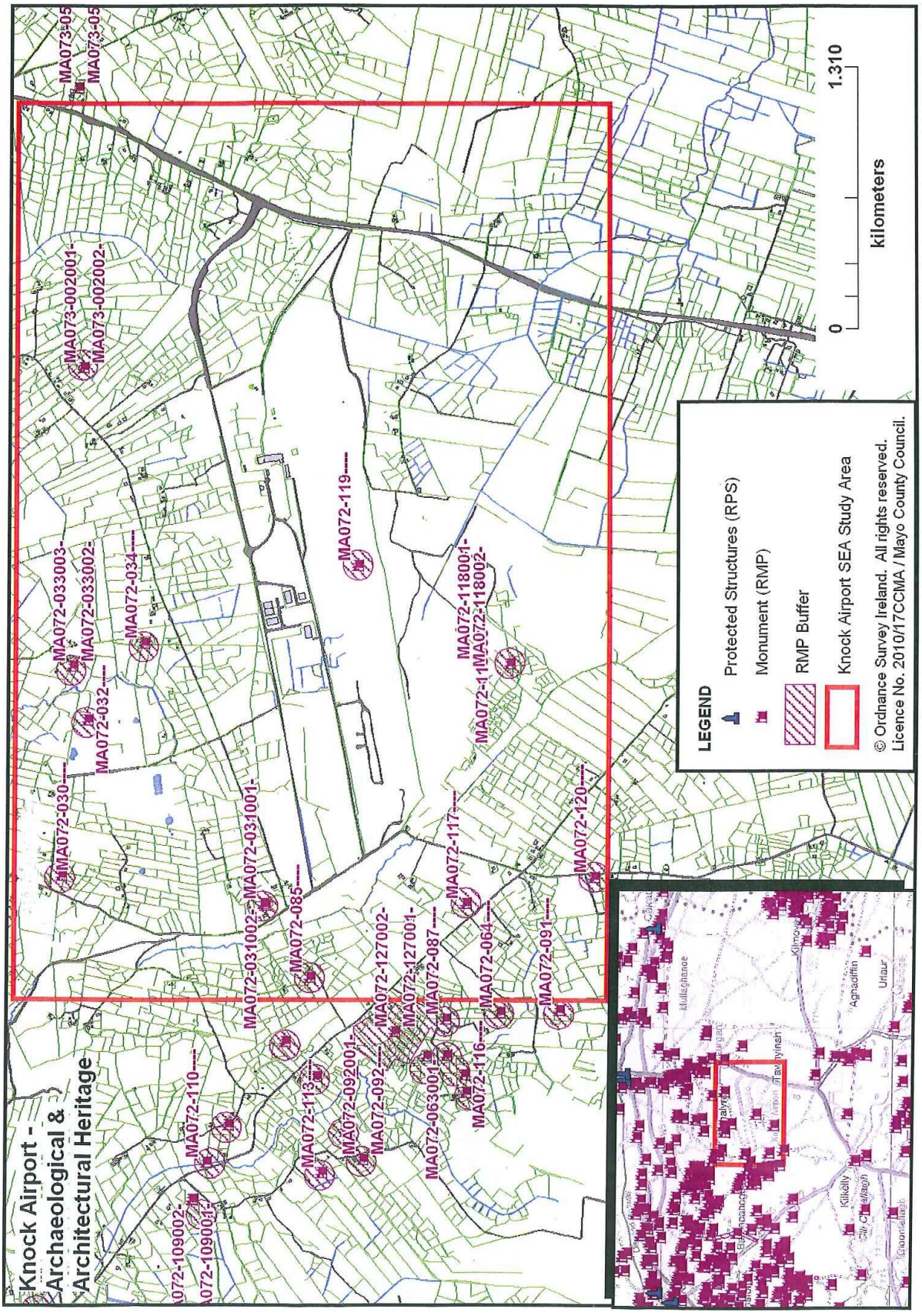
County Mayo has a rich archaeological heritage. This wealth is reflected in the RMP which lists and protects monuments and places in Co. Mayo under Section 12 of the National Monuments (Amendment) Act, 1994. Nearly 6,000 areas of archaeological importance (representing almost 8,000 elements) are included in the RMP for Co. Mayo spanning over 7,000 years. This RMP is constantly updated as new sites and monuments are discovered. There are 51 National Monuments in the ownership or guardianship of the State in Co. Mayo and a further 11 National Monuments that are subject to Preservation Orders.

There are 12 (twelve) RMP's within the Strategic Environment Assessment Area of the Proposed Ireland West Airport Knock Planning Scheme.

Table 12 National Monuments within the study area

RMP. No	***Monument Type***
MA072-030	Enclosure
MA072-031	Enclosure and Souterrain
MA072-032	Enclosure- Site
MA072-033	Enclosure and Children's Burial Ground
MA072-034	Enclosure
MA072-085	Wedge Tomb
MA072-117	Fulacht Fiadh
MA072-118	Ecclesiastical Remains Possible Graveyard-Possible Children's Burial Ground-Possible House Site
MA072-119	Megalithic Tomb
MA072-120	Fulacht Fiadh
MA073-002	Enclosure and Children's Burial Ground
MA073-034	Mound

Figure 20 National Monuments within the study area.



4.8.4 Architectural Heritage

'Architectural Heritage' is defined in the Architectural Heritage (National Inventory) and Historic Monuments Act, 1999, as meaning all structures and buildings together with their settings and attendant grounds, fixtures and fittings, groups of such structures and buildings, and sites which are of architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.

Within this range of building types are structures, streetscapes, village and town cores of such architectural heritage significance or special character that they are deemed worthy of protection either as individual elements which are listed on the Record of Protected Structures (RPS), as groups of buildings within Architectural Conservation Areas (ACA's) or as particular built heritage types that have been recorded (by inventories) because they form part of the unique identity of Mayo.

The legislative framework covering architectural heritage includes the National Monuments Act 1930-2004 which constitutes a broad piece of legislation dealing with the protection of historic monuments; and the Planning Developments Acts 2000 – 2002. Apart from National Legislation there are also European and International Legal Frameworks to be consulted in relation to architectural heritage including the Venice Charter 1964; the Washington Charter 1987: the Burra Charter 1979 / 1981 / 1988; the NARA Charter on Authenticity 1994; and the Granada Convention for the Architectural Protection of Architectural Heritage of Europe (1985).

County Mayo has a rich architectural heritage, of which 271 structures are in included on the RPS. The full list of protected structures and a brief description of each structures listed is set out in Volume 4 of the MCDP 2014-2020. Whilst the RPS includes some of the architectural heritage of the County deemed worthy of preservation and conservation, it could not be described as a definitive list. In addition, there are many buildings and structures, not included in the RPS which are important in their own right as part of the built heritage of the County.

There are no protected structures within the Strategic Environment Assessment Area of the proposed Ireland West Airport Knock Strategic Development Zone (SDZ). The Ireland West Airport Knock Catchment Area extends into Co. Roscommon and Co. Sligo.

Figure 21 Map of Architectural Heritage

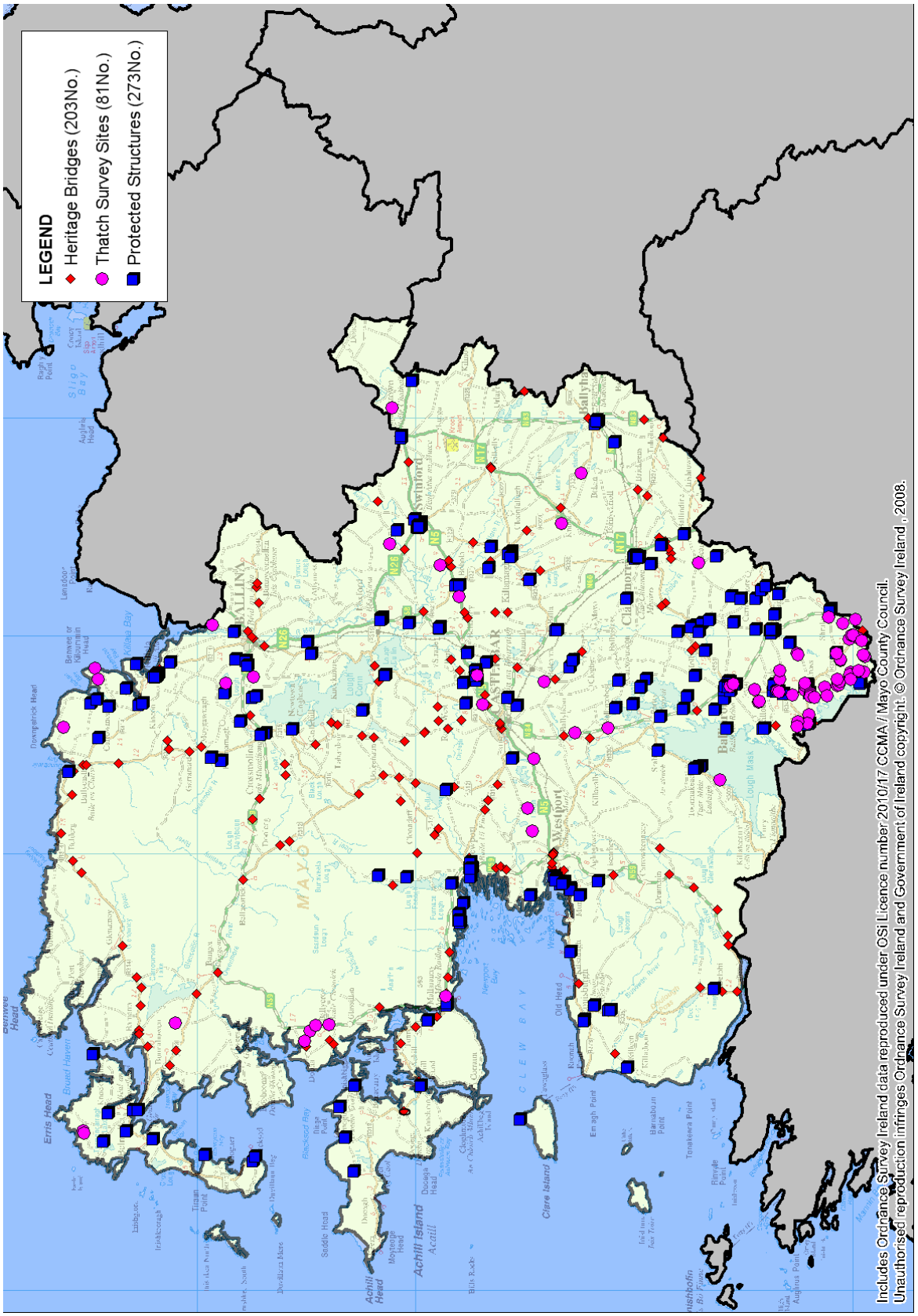
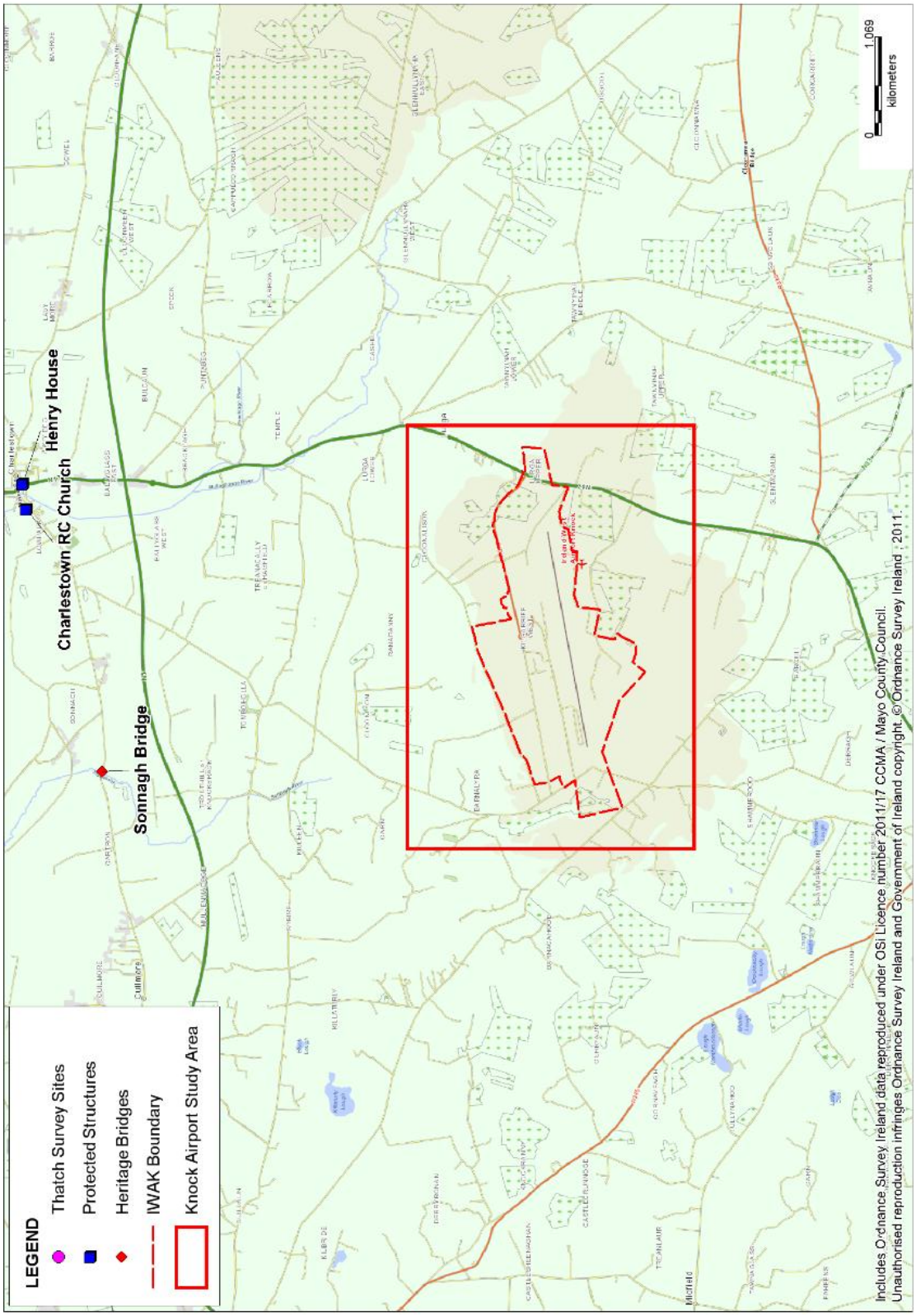


Figure 22 Map of Architectural Heritage near the Ireland West Airport Knock Study Area



4.8.5 Existing Environmental Problems relating to Cultural Heritage

4.8.5.1 Archaeological Heritage

The archaeological heritage is a non-renewable resource. Increased development pressure raises the potential for impact on the archaeological resource. Although the aforementioned cultural heritage is protected under legislation, impacts can still occur as a result of development. Proposed developments which cause ground disturbance can damage previously unknown subsurface archaeology.

4.8.6 Evolution of Cultural Heritage in the Absence of a Planning Scheme for Ireland West Airport Knock

4.8.6.1 Archaeological Heritage

In the absence of a Planning Scheme at Ireland West Airport, development would have no guidance as to where to be directed and planning applications would continue to be assessed on an individual basis. Cultural Heritage would continue to be protected under a number of strategic actions relating to archaeological protection. The Cultural Heritage would be impacted upon by the nature of permitted applications.

4.9 Landscape

4.9.1 Introduction

Landscapes are areas which are perceived by people and are made up of a number of layers: landform, which results from geological and geomorphological history; land cover, which includes vegetation, water, human settlements, and; human values which are a result of historical, cultural, religious and other understandings and interactions with landform and land cover.

Mayo presents a wide range of landscapes. These range from complex agricultural patterns in the lowlands with small roads and houses; to a deeply indented and islanded Atlantic coastline; to the great and often empty uplands and moorlands of the west and north of the County.

4.9.2 Receiving Environment

The airport has been established at this location since 1985. The location is on elevated lands adjoining the N17 approximately 8km South of Charlestown. The existing airport facilities and adjoining business park are located on an upper plateau that gently slopes to the West and steeply to the North. The upper plateau consists mainly of peat land with the various component parts of the airport on reclaimed lands. The runway is located on the upper platform as is an Ordnance Datum of approximately 200m above sea level. On the northern and eastern side of the airport the topography falls steeply. The lands to the eastern side of the airport also have extensive areas of coniferous forestry. Extensive views from the north and northern east are available from the Regional Road. (R367)

There is limited tree cover within the environs of the Strategic Development Zone study area. There are areas of coniferous forests to the Eastern side of the airport and on either side of the Regional Road (R367) from the N17. To the North of the R367 the steeply dipping fields consist of poor grassland and post and wire/stone ditch field boundaries. The predominant vegetation cover within the areas of permitted and proposed development is a mixture of existing hardstand, upland grassland and heath.

The built environment within the study area consists of the airport campus and the adjoining industrial park. The area is rural in character and consists of a dispersed rural housing. There are no residential units within the proposed Planning Scheme boundary.

4.9.3 Landscape Appraisal (Mayo County Development Plan 2014-2020)

County Mayo's Landscape Appraisal (Mayo County Development Plan 2014-2020) subdivides the County into sixteen distinct landscape character units each containing an area of land with similar character-giving elements such as slope, vegetation and land use. The appearance of the landscape is relatively uniform within each Character Unit.

Ireland West Airport Knock is located within Area K designated in the landscape appraisal as "East – Central Drumlin Spine". This area is made up of glacial drumlins that are uniform at its western end near its transition with the distinct drumlins of Clew Bay. In the east, these become less uniform and severe, and the terrain merges into several sets of geologically distinct and isolated hills as the unit encapsulates the towns of Castlebar, Swinford, and Charlestown. The land cover is a mixture of bog/moorland, poor quality pasture and transitional woodland scrub with better quality pasture to the east and south.

This area is characterised by a mixed land use pattern which includes peat bogs and agricultural lands with significant areas of natural vegetation and transitional woodland scrub. There are also significant areas where pasturelands represent a major land use. Charlestown, Castlebar and Swinford towns display the significance of urban settlement areas in this region of the County.

The critical landscape factors for the area are defined as follows:

- Undulating topography
  Mildly undulating topography as represented in this character unit by drumlins and low hills has the ability to both shelter and absorb the visual impact of development. Firstly, the physical shielding of a built form within the lee of hill where it does not break the skyline renders it visually unobtrusive and reflective of landscape scale. Secondly, the dynamic and complex nature of undulating country provides fore, middle, and distant ground to a vista that helps to provide a realistic scale and visual containment not available in open country.

- Shelter Vegetation
  In a similar manner to undulating topography, shelter vegetation has a shielding and absorbing quality in landscape terms. It can provide a natural visual barrier and also adds to the complexity of a vista, breaking it up to provide scale and containment for built forms.

- Prominent Ridge Lines
  These occur as either primary ridgelines (visible only against the sky from any prospect) or secondary ridgelines (visible at least from some prospects below a distant primary ridge line). There are major primary ridgelines beyond the north-west boundary of this character unit, and it also contains some relatively low and isolated examples of primary and secondary ridge lines through its centre. Ridge lines perform the important roles of providing an area with its identity, acting as dominant landscape focal points, and defining the extent of visual catchments. As with other natural linear features such as shorelines it is important that development does not interrupt the integrity of primary ridgelines. Due to the dominating influence of ridgelines, in instances where penetration does occur, development can appear insubordinate to the landscape in which it sits.

The Landscape Appraisal identifies vulnerable features across the County including river banks, lake shorelines, the coastline and the skylines of the County's uplands and it is a policy of the Council to recognise and facilitate appropriate development in a manner that has regard to the character and sensitivity of the landscape, to ensure development does not have a disproportionate effect on the landscape and scenic views in terms of location, design and visual prominence. With regard to both the character units and the vulnerable features, the Appraisal groups together character units into Policy Areas which provide for the guidance of development across the County. There are four Landscape Policy Units in County Mayo.

The Strategic Development Zone is located in Policy Area 4 designated in the Landscape Appraisal as "Drumlins and Inland Lowlands." These undulating areas of pasture, woodland and forest are considered to have a generally similar ability to absorb development. Many of these areas are underlain by glacial drumlins and incorporate low-lying Lakelands.

The policies associated with this area are as follows:

- Recognise that these areas are made up of a variety of working landscapes and contain the vast proportion of the county's population within principle towns and on rural holdings. These also incorporate all of the major national primary and regional roads, and railways.
- Continue to permit development that can utilise existing infrastructure, whilst taking account of absorption opportunities provided by the landscape and prevailing vegetation.
- Encourage development that will not significantly interfere or detract from scenic Lakeland vistas, as identified in the Development Plan, when viewed from areas of the public realm.
- Encourage development that will not result in detrimental impacts (through excessive bulk, scale or inappropriate siting) on the landscape at a local or micro level as viewed from areas of the public realm.
- Encourage development that will not interrupt or penetrate distinct linear sections of primary ridge lines when viewed from areas of the public realm.

- Facilitate developments that have a locational requirement to be situated on elevated sites (e.g. telecommunications and wind energy structures). It is necessary however to ensure that adverse visual impacts are avoided or mitigated wherever possible.

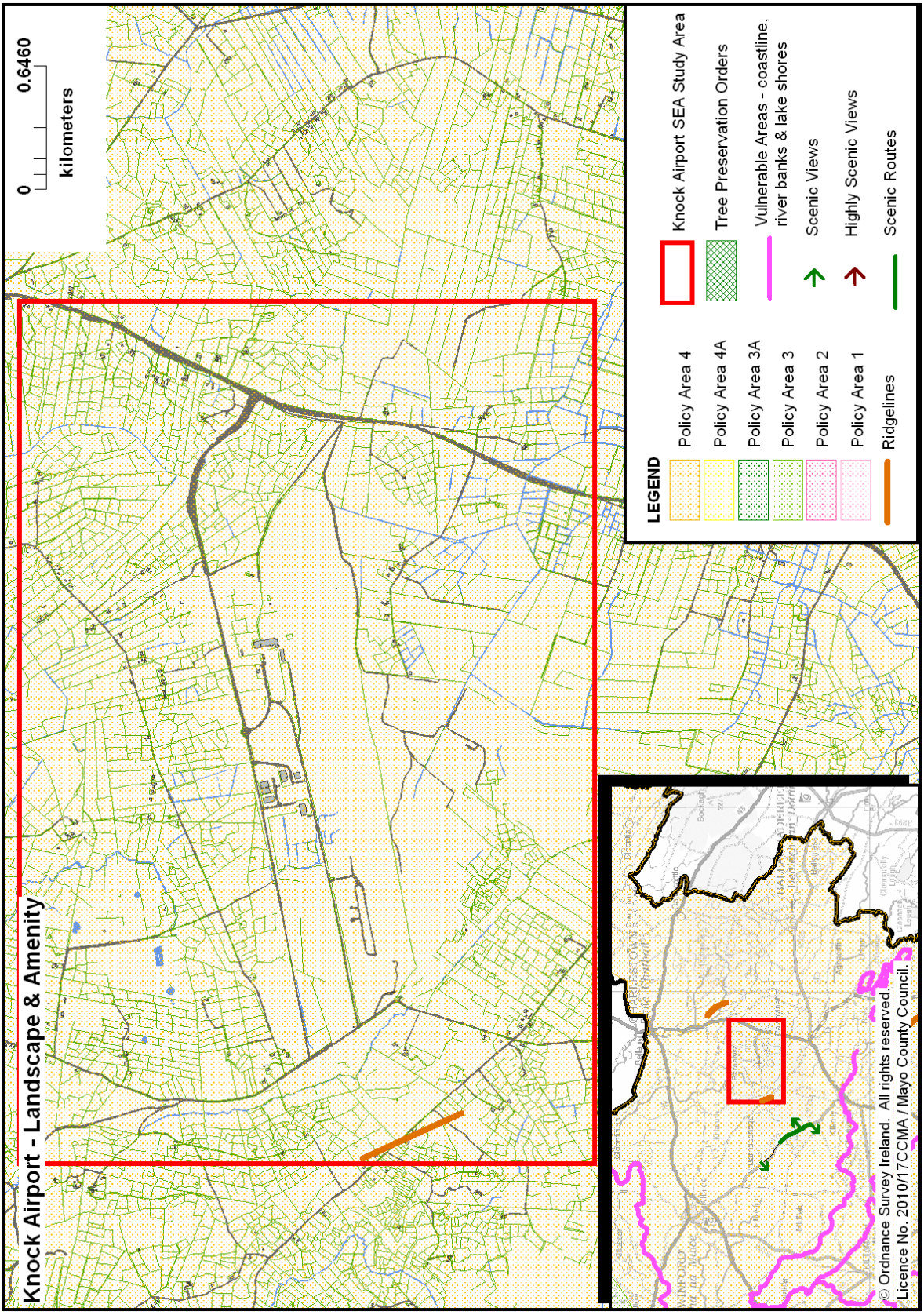
4.9.4 Existing Environmental Problems relating to Landscape

An environmental problem associated with regard to the environmental component of landscape is the visual impact on the landscape. The airport campus is located in a prominent location to the summit of a hill. The existing buildings and associated lighting can be viewed from a considerable distance. There is very little attempt to screen development on the landscape with the topography of the area offering some form of screening.

4.9.5 Evolution of Landscape in the Absence of a Planning Scheme for Ireland West Airport Knock

In the absence of a Strategic Development Zone, no significant change will occur to the existing landscape and visual resource of the area and the existing facilities at the airport will remain as a feature in the surrounding landscape. A plan at this location would address the visual aspect by applying various methods to screen and reduce the impact of any existing and proposed development at this location. An SDZ Planning Scheme would also ensure a consistency in terms of design, materials and finishes.

Figure 23 Landscape and Amenity Map



4.10 Cumulative Environmental Impacts

Taking all the environmental sensitivities of the study area and mapping then onto a cumulative environmental sensitivity map highlights particular areas on the study area that may need further protection.

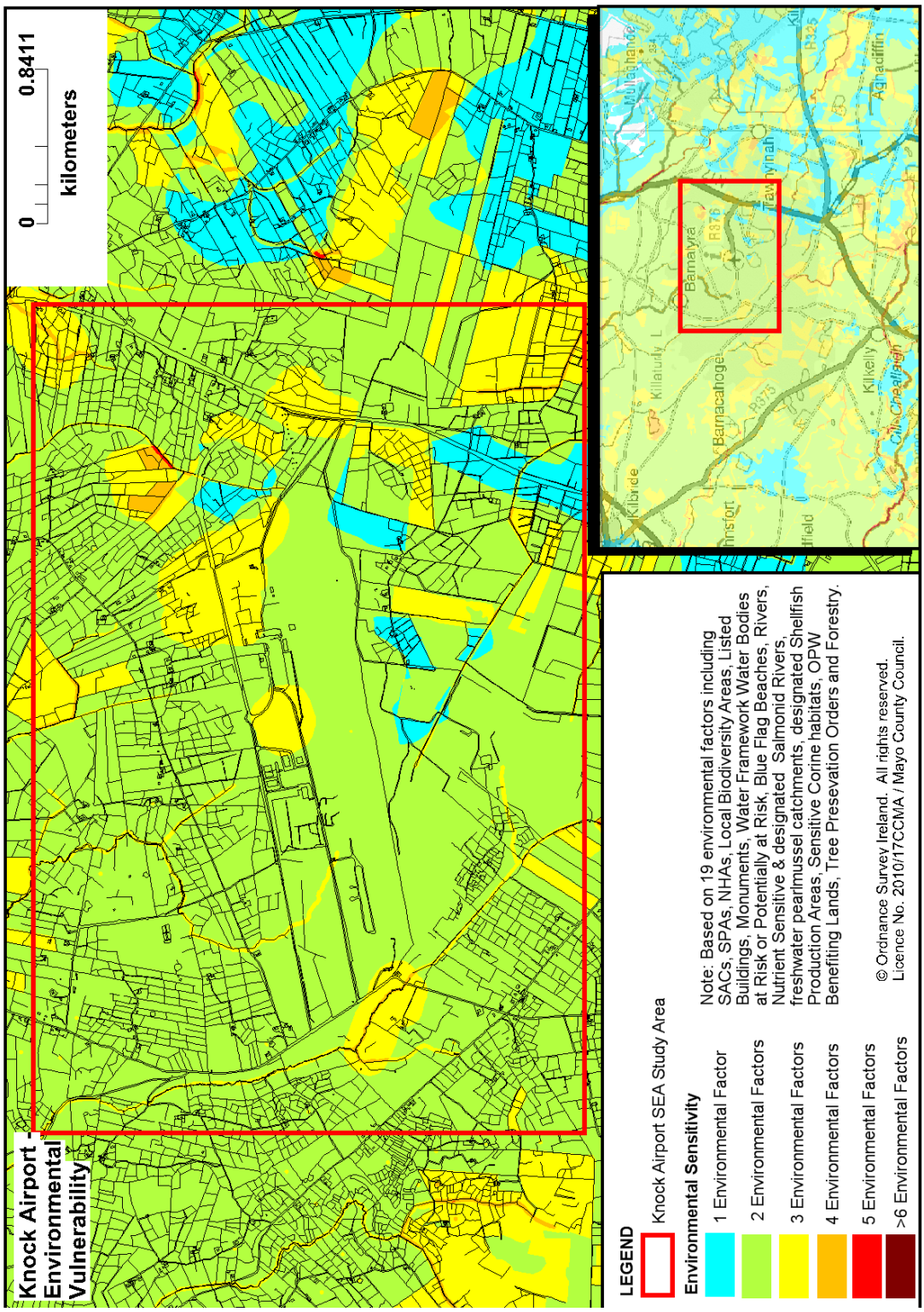


Figure 24 Cumulative Environmental Sensitivity Map

4.10.1 Interrelationships between Environmental Factors

The interrelationship between each environmental factor has been assessed to identify areas of consistency in relation to each factor. This is important as it examines how each environmental factor relates to each other, which gives a greater understanding in determining Environmental protection objectives under each factor and developing appropriate mitigation. In general, the eight factors are compatible with each other. There is potential that disposal of soils would impact on ecology sensitive environmental receptors and that soil run-off could impact on ecologically sensitive watercourses. Any change to the natural landscape will impact on water quality (and quantity, in some cases) by diversion of drain flow, increase/reduction of water volume, slope steepness and orientation. In some cases, there will be no obvious relationship between environmental factors such as there is no obvious link between archaeology and climate factors. Also, some factors will be in conflict with each other, for example material assets such as new infrastructural development will impact on archaeological sites and monuments.

The interrelationship between environmental factors is an important step in the development of environmental protection objectives. If the factors are consistent or mutually exclusive then the environmental protection objectives will support each other, which will feed into the policies and objectives of the Strategic Development Zone. Where they are in conflict with each other, mitigation measures will be suggested by the SEA. Again, this will feed into the policies and objectives of the Planning Scheme.

Section 5: Environmental Protection Objectives

5.1 Introduction

Environmental Protection Objectives (EPOs)are broad objectives pertaining to environmental elements which provide a benchmark "intention" against the environmental effects of the draft plan can be tested. For example, a number of EPO's have been developed for the environmental elements examined as part of this assessment. They have been devised to measure against which the environmental effects of the Ireland West Airport Knock Planning Scheme can be tested.

The SEA process assesses the Draft Planning Scheme as it evolves in terms of its environmental impacts, positive, negative, neutral, cumulative and synergistic and also in terms of duration for example: short, medium and long term, furthermore, considering the temporary, permanent and secondary effects. This process highlights how improvements can be integrated into the planning scheme to increase its environmental performance and maintain environmental resources. The purpose of SEA Objectives is to ensure that the assessment process is transparent and robust and that the IWAK SDZ Planning Scheme considers and addresses the potential environmental effects.

The use of Environmental Protection Objectives fulfils obligations set out in Section F, Schedule 2B of the Planning and Development (SEA) Regulations 2004. They are a tool used to verify the policies and objectives that would be likely to result in significant adverse impacts so that the alternatives may be considered.

The EPOs are presented in this chapter and are developed into a monitoring programme in the form of targets and indicators which are presented in more detail in Chapter 9 Monitoring Programme. To facilitate consistency with the primary land use plan for the County and reflect data gathering requirements, these EPO's developed for the SEA of the Mayo County Development Plan 2014-2020. Where necessary the EPO's are adapted to reflect particular environmental considerations for this Planning Scheme.

Table 13 Environmental Receptors and Environmental Protection Objectives

SEA Topic	Environmental Protection Objectives
Biodiversity, Flora and Fauna	**B1:** Conserve and protect designated habitats and protected species.
	B2: Maintain the biodiversity of interdependent habitats and species in the wider landscape
Population and Human Health	**HP1:** To improve the working populations quality of life based on a high-quality working environment, reduction in commuting distance and the promotion of sustainable modes of transport within, to and from Ireland West Airport Knock
	HP2: To protect human health from incompatible land uses associated with locating at or adjoining airports.
Soils and Geology	**SG1:** To identify and protect areas which may be deemed to have a risk of landside
Water	**W1:** To prevent deterioration of surface waters of good and high status

	W2: To restore states of water bodies of moderate, poor and bad to good status
	W3: To reduce surface water pollution from priority substances
	W4: To achieve water-related designated protected area objectives and to support the achievement of favourable conservation status wherever such plans exist
Air Quality	**AR1:** Maintain good air quality status in line with CAFÉ Directive requirements and the National Climate Change Strategy.
Noise	**N1:** To promote appropriate noise control measures on operations within the Ireland West Airport Knock Planning Scheme area.
	N2: To encourage the implementation of control measures on road traffic noise within the Ireland West Airport Knock Planning Scheme area
Climate	**C1:** To maximise the areas contribution to the national decrease in Green House Gases
Flooding	**F1:** To prevent development on lands which pose – or are likely to pose in the future – a significant flood risk.
Roads & Transport Infrastructure	**R1:** To protect the road network
	R2: To prevent any interference with the safety and efficiency of aircraft operations in the vicinity of the airport.
Energy	**E1:** To reduce the reliance on non-sustainable energy sources by the promotion and use of renewable energy resources
Waste Water	**WW1:** To provide adequate waste water infrastructure to meet existing and future demands for such provision
Drinking Water	**DW1:** To prevent deterioration of the status of water bodies with regard to quality, quantity and to improve water body status of rivers, lakes and groundwater to at least good status as appropriate to the WFD, providing good sources of abstraction for drinking water.
Waste Management	**WM1:** Minimise waste production and maximise recycling and recovery through the introduction of sustainable waste management practices.
Archaeological Heritage	**CH1:** To protect the archaeological heritage and especially sites identified in the Record of Monuments and Places, National Monuments in the ownership or guardianship of the State and National Monuments that are subject to Preservation Orders and to safeguard the integrity of the archaeological sites in their setting.
	CH2: To protect the architectural heritage of County Mayo with regard to protected structures, Architectural Conservation Areas and other elements highlighted in the baseline date in Section 4.
Landscape	**L1:** To protect the landscape character of the area.

Table 14 Biodiversity, Flora and Fauna- Targets and Indicators

Environmental Receptor	Target	Indicator
B1: Conserve and protect designated habitats and protected species	To achieve and maintain favourable conservation status for habitats and species.	Number of sites for Nature Conservation to be adversely affected by the implementation of the SDZ.
B2: Maintain the biodiversity of interdependent habitats and species in the wider landscape	No loss or degradation of locally rare/distinctive habitats/species.	Changes in population and range of protected species. Number of sites containing locally rare/distinctive species/habitats to be adversely affected by the implementation of the SDZ.
	No loss or fragmentation of ecological corridors.	Percentage loss of ecological connectivity between areas of local biodiversity as a result of implementation of the SDZ.

Table 15 Population and Human Health- Targets and Indicators

Environmental Receptor	Target	Indicator
HP1: To improve the working populations quality of life based on a high-quality working environment, reduction in commuting distance and the promotion of sustainable modes of transport within, to and from Ireland West Airport Knock	Provide a good quality of recreation and green space within the working environment.	That all development has sufficient recreation and open space for the working and visiting population to the area.
	Reduction in commuting distance within the catchment area.	Reduction in the percentage of persons distance to work that is greater than the distance to the airport from the Census data Indicator
	Increase of sustainable transport options including public transport, cycling and walking.	Promotion of cycleways and walkways for internal circulation throughout the Plan area and any increase in use of public transport or car sharing schemes for employees within the area.
HP2: To protect human health from incompatible land uses associated with locating at or adjoining airports.	To ensure that all development complies with the land use requirements of the public safety	The avoidance of incompatible land uses in the area around the airport.

	zones, safeguarding maps and noise contour maps	

Table 16 Soils and Geology- Targets and Indicators

Environmental Receptor	Target	Indicator
SG1: To identify and protect areas which may be deemed to have a risk of landside	No occurrence of landslides	Steepness of slopes, moisture content of peat, depth of peat, nature of layer below peat.

Table 17 Water- Targets and Indicators

Environmental Receptor	Target	Indicator
W1: To prevent deterioration of surface waters of good and high status.	No deterioration of surface waters of good and high status.	Quality elements for ecological status (biological, hydro morphological, chemical and physic-chemical elements).
W2: To restore states of water bodies of moderate, poor and bad to good status	No deterioration of water quality of streams/groundwater on site.	Quality elements for ecological status (biological, hydro morphological, chemical and physic-chemical elements).
W3: To reduce surface water pollution from priority substances.	No emissions, discharges or losses of priority substances to surface waters.	Chemical and physic-chemical elements of water bodies, in particular, specific pollutants.
W4: To achieve water-related designated protected area objectives and to support the achievement of favourable conservation status wherever such plans exist.	No exceedance of specific water quality standards and no deviation from environmental quality objectives established to protect natural habitats and species.	Quality elements for ecological status (biological, hydro morphological, chemical and physic-chemical elements).

Table 18 Air and Climatic Factors - Targets and Indicators

Environmental Receptor **Air Quality**	Target	Indicator
AR1: Maintain good air quality status in line with CAFÉ Directive requirements and the National Climate Change Strategy.	Ensure monitoring results are maintained within the appropriate emission limit values.	Air monitoring data to indicate compliance with appropriate policies and legislative requirements.
	An increase in the percentage of the people travelling to the airport by public transport.	Percentage of workers/ airport users travelling to the airport by

		public transport or non-mechanical means.
	A decrease in the distance travelled to work/airport by users of IWAK. A reduction in car dependency will generate a reduction in car-based emissions, for example- increase coach transport.	Average distance travelled to work/airport by the users of IWAK.
	Increase the number of energy efficient buildings and Co2 neutral developments in the area. Reduce waste of energy and maximise use of renewable energy sources.	Number of BER certificates issued for Area. Indicator Number of Co2 neutral developments in the Area
Noise		
N1: To promote appropriate noise control measures on operations within the Ireland West Airport Knock Planning Scheme area.	Minimise the number of incompatible developments within the various noise contour categories	Number of developments located with the noise contour categories
N2: To encourage the implementation of control measures on road traffic noise within the Ireland West Airport Knock Planning Scheme area.	Reduce the quantities of vehicular traffic at IWAK	Number of traffic movements at IWAK
Climate		
C1: To maximise the areas contribution to the national decrease in Green House Gases.	Increase the number of energy efficient buildings and Co2 neutral developments in the area. Reduce waste of energy and maximise use of renewable energy sources.	The amount of BER certificates issued for Area. Indicator. Number of Co2 neutral developments in the rea.
	To implement the EU Emissions Trading Directive and Irelands National Allocation Plan for Emission Trading to ensure that the Area becomes Carbon Neutral.	To promote awareness of energy efficient technologies to off-set emissions from increased aircraft movements to achieve a carbon neutral area.
Flooding		
F1: To prevent development on lands which pose – or are likely to pose in the future – a significant flood risk.	Minimise developments granted permission on lands which pose – or are likely to pose in the future- a significant flood risk.	Number of developments granted permission on land which pose – or are likely to pose in the future – a significant flood risk.

Table 19 Material Assets- Targets and Indicators

Environmental Receptor	Target	Indicator
Roads		
R1: To protect the road network.	To ensure that all traffic to the area uses the national road network.	Increase in traffic movements to and from the area at the junction with the national route.
	To reduce traffic using the local roads in the area to access the Plan area.	Reduction in traffic movements to and from the area via the local road network.
R2: To prevent any interference with the safety and efficiency of aircraft operations in the vicinity of the airport.	That all development complies with safety requirements and uses are compatible with location at airports.	The number of development projects permitted with the safety zones around the airport.
Energy		
E1: To reduce the reliance on non-sustainable energy sources by the promotion and use of renewable energy resources.	To reduce energy consumption from non-sustainable sources to a minimum by the adoption and use of renewable energy sources.	Increase in renewable energy projects.
		Promotion of energy efficacy in the plan area.
Wastewater		
WW1: To provide adequate waste water infrastructure to meet existing and future demands for such provision	To upgrade the existing waste water treatment infrastructure to provide increased capacity for the short-term development	Upgrade of WWTP from 700 PE to 1400PE capacity
	To provide new waste water treatment infrastructure for the estimated future development of the area.	Provide now WWTP for 5000 PE capacity
Drinking Water		
DW1: To prevent deterioration of the status of water bodies with regard to quality, quantity and to improve water body status of rivers, lakes and groundwater to at least good status as appropriate to the WFD, providing good sources of abstraction for drinking water.	No deterioration of the status of waters and restoration to good status of waters currently at moderate, poor or bad status.	Trophic status and faecal coliform count per 100ml of groundwater Indicator.
	Comply with the Drinking Water Regulations, 2014.	drinking water annual report (EPA).

	Progressively reduce chemical pollution in waters Target Prevent deterioration of and limit pollution inputs to surface water and ground water.	Interim water status report in 2017.
Waste Management		
WM1: Minimise waste production and maximise recycling and recovery through the introduction of sustainable waste management practices.	All Waste activity is regulated. Diversion of biowaste from landfill and reduction in landfill emissions. All waste activity is regulated.	Reduced tonnage of waste collected with increased number of customers Reduction in enforcement actions required Increase in the percentage of customers receiving a refuse collection service and decrease in proportion of waste arising being landfilled and increase in recovery and recycling tonnages

Table 20 Cultural Heritage- Targets and Indicators

Environmental Receptor	Target	Indicator
CH1: To protect the archaeological heritage and especially sites identified in the Record of Monuments and Places, National Monuments in the ownership or guardianship of the State and National Monuments that are subject to Preservation Orders and to safeguard the integrity of the archaeological sites in their setting.	To ensure that Cultural Heritage of the planning scheme area is maintained and protected from damage and deterioration.	Number of developments carried over the lifespan of the Proposed Ireland West Airport (IWAK) Planning Scheme which result in the full or partial loss of the archaeological heritage and especially sites identified in the Record of Monuments and Places, National Monuments in the ownership or guardianship of the State and National Monuments that are the subject of Preservation Orders. The integrity of the archaeological sites in their setting can also be impacted upon by new developments
Architectural Heritage		
CH2: To protect the architectural heritage of County Mayo with regard to protected structures,	No development carried out over the lifespan of the Planning Scheme shall result in the full or	The number of developments carried out over the lifespan of the Planning Scheme which result in

Architectural Conservation Areas and other elements highlighted in the baseline date in Section 4.	partial loss of architectural heritage	the full or partial loss of architectural heritage.
	No development carried out over the lifespan of the Planning Scheme will result in the full or partial loss of heritage bridges of Mayo	The number of developments carried out over the lifespan of the Planning Scheme which result in the full or partial loss of the heritage bridges of Mayo.

Table 21 Landscape- Targets and Indicators

Environmental Receptor	Target	Indicator
L1: To protect the landscape character of the Planning Scheme area and lands adjacent to it.	To minimise the intrusion of new developments on the landscape character of the area.	that all development proposals include measures to minimise any intrusion that the development may have on the landscape character of the area.
	To minimise the intrusion of exiting development on the landscape character of the area.	That all development proposal examines if they can introduce measures to reduce the impact of existing structures on the landscape character.

Section 6: Alternative Scenarios

6.1 Introduction

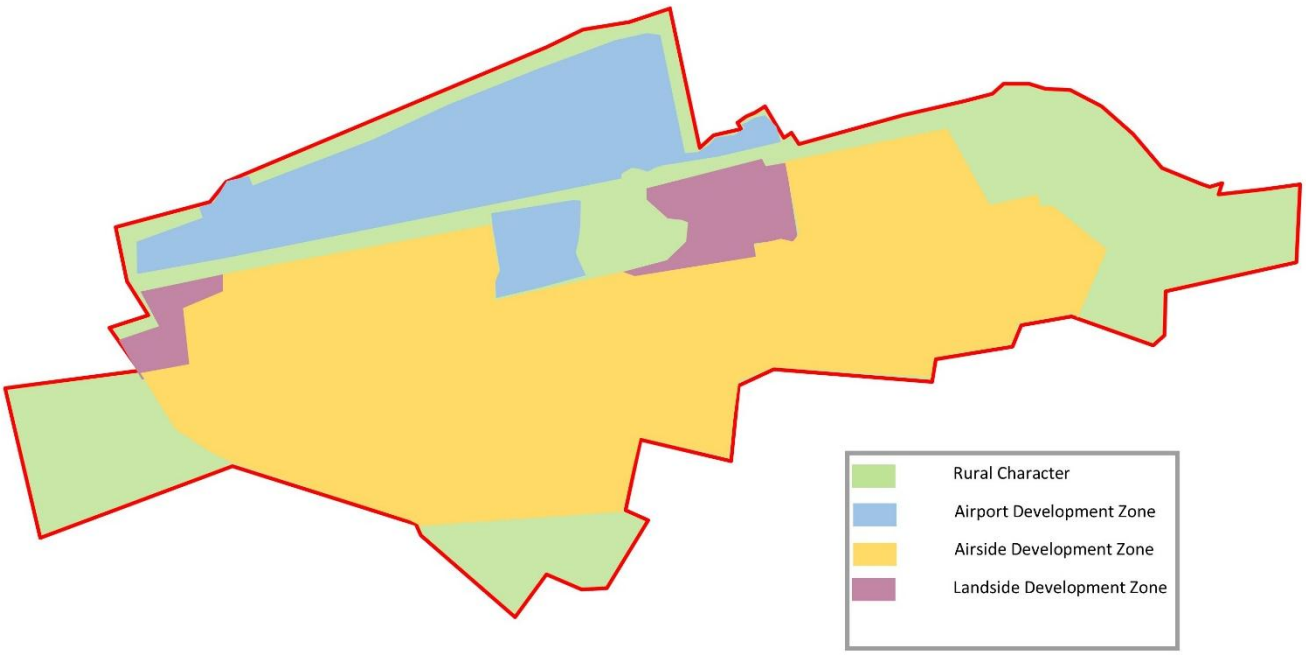
Article 5 of the SEA Directive requires the Environmental Report to assess the likely significant effects of implementing a plan and "reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme".

SEA involves a systematic and explicit appraisal of alternatives. It is standard practice when devising a plan that various ways of fulfilling its objectives are considered. Mayo County Council, as the plan-making authority, has considered alternative ways of achieving the objectives of the Strategic Development Zone for Ireland West Airport Knock.

The scenarios were established taking into consideration the strategic aims of the Planning Scheme which are:

- to enable the development of Ireland West Airport, Knock as a strategically important international gateway to the Region through the continued growth of the Airport as a major transportation hub
- to enable the full development potential of Ireland West Airport, Knock, as a strategic economic/enterprise hub for the Region, to be fully realised in a sustainable, co-ordinated and plan led manner whilst ensuring the efficient and effective operation of the Airport.

6.2 Do Nothing Scenario



In May 2017 284 Hectares of lands at Ireland West Airport Knock was designated as a Strategic Development Zone S.I 266/2017 by the Government of Ireland.

The Draft Strategic Development Zone supersedes the Local Area Plan (LAP) for IWAK was prepared in accordance with Sections 18 – 20 of the Planning and Development Acts 2000 – 2010. The SDZ designation provides for fast track planning procedures, it is an appropriate mechanism to develop lands at IWAK to offer a spatial planning approach. IWAK represents a shared outlook for the future economic development for Mayo and the North/ West region. IWAK is a rural location and holds a strong economic focus of the designation which is to facilitate business and enterprise development in tandem with the growing transport role and the needs of the airport. A Planning Scheme must be designed no later than two years after the designation of lands by the Government.

Therefore, the current state of the site or the do-nothing approach is considered not to be appropriate alternative scenario for the following reason:

- The lands are now covered by a new statutory instrument S.I 266/2017 which decreases the amount of lands covered under the Local Area Plan.

The Do Northing Scenario is not considered to be a reasonable alternative for the SDZ area and will not be considered.

6.3 Alternative Scenarios

The two alternative scenarios outlined below are underpinned by the zonings established in the LAP 2012-2018 for IWAK and the restrictions required to comply with public safety zones within and in the immediate vicinity of the airport. Therefore, both scenarios comprise of four core development areas; The airport and passenger terminal; MRO Airside Campus; Hotel and Conference facility and a Business and Enterprise Campus. It is anticipated that development is likely to occur at varying paces and a pragmatic approach will be taken.

Each of the Development Areas will have an individual implementation approach. It is recognised that each of the development areas are mutually independent and likely to develop at varying paces and should not be tethered by the pace of unrelated development in order to progress.

For this reason, the scenarios outlined below, envisage largely identical land-uses in the airside and landside development zones (to the south of the primary local road), with the main alternatives in each scenario limited to variations in the layout of the Hotel and Conference/Business and Enterprise Campus to the north of the Primary County Road.

Therefore, because of the broadly identical nature of both scenarios outlined below in terms of site boundaries, spatial arrangement proposed land uses and restriction imposed in order to have cognisance of Airport Safety Standards; the testing of alternatives with the EPO's contained in Table 6.4 below concentrates solely on the main differences between both proposed scenarios and refrains from listing the similarities between both scenarios. It should also assumed that all proposals with regard to service provision and matters such as drainage, building design, energy efficiency, public safety, protection of archaeological heritage and waste disposal are common to both proposed scenarios, unless otherwise stated.

6.3.1 Scenario 1

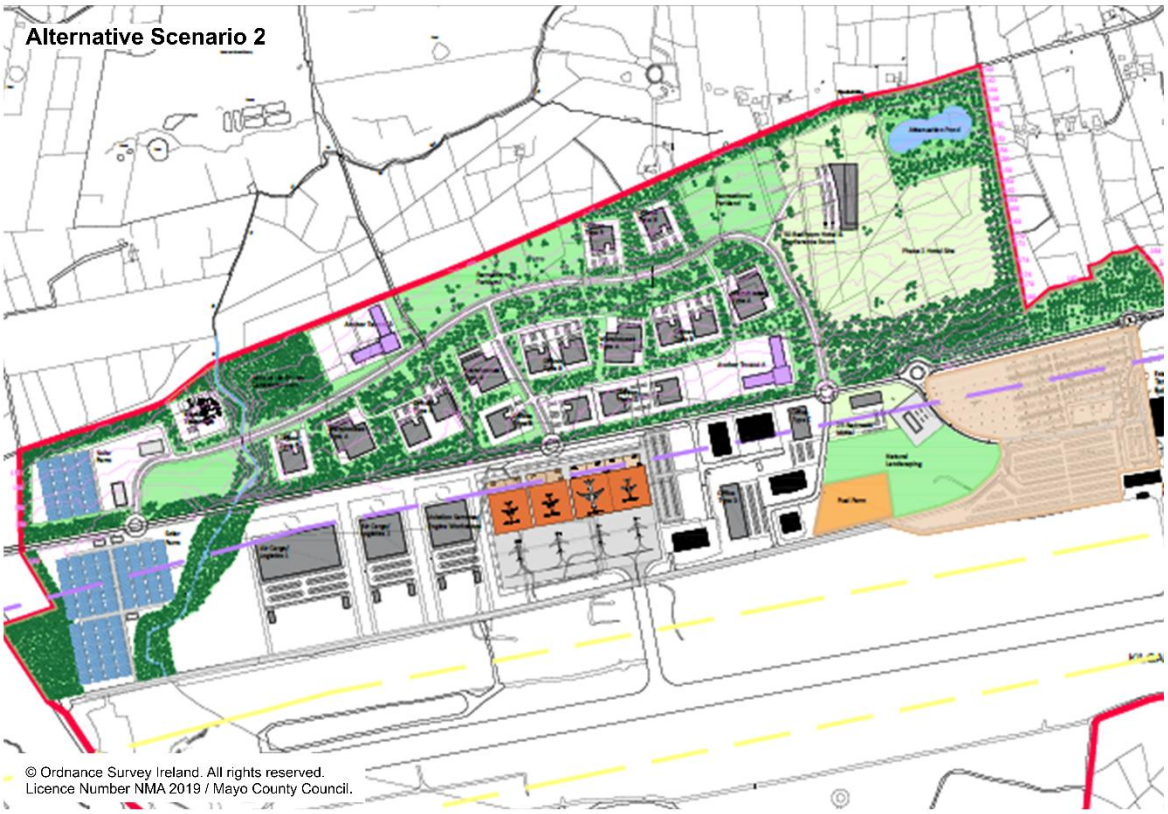
Alternative Scenario 1

Scenario No. 1 creates a somewhat formal and urban style environment, with a rigid grid layout incorporating a centrally located avenue dissecting the Business and Enterprise campus from east to west. This scenario proposes hotel and conference facilities in the south eastern corner of the business park and a series of public playing pitches in a centrally located section to the north of the central avenue and extending to the tertiary county road along the northern site boundary. The main business and Enterprise elements are in 6 no. individual zones separated by internal access roads. The two largest zones address the primary county road to the south. Three of the smaller business and enterprise zones are in the north eastern corner of the business and enterprise campus adjacent to the tertiary county road to the north. Utilities, including a surface water attenuation pond are located at the western end of the campus immediately opposite a photo-voltaic solar energy park on the southern side of the primary local road, immediately adjacent and to the west of the proposed MRO facility.

Key Elements of Scenario

- Rigid, urban, grid style layout.
- Increased hard landscaping.
- Centrally located access road dissecting site from east to west
- Playing pitches and active amenity area.
- 200-bedroom Hotel and Conference centre.

6.3.2 Scenario 2



Scenario 2 adopts a less formal and rigid parkland style layout than scenario 1 by referencing to a greater degree the rural setting of IWAK. The Business and Enterprise Campus/Hotel and Conference facilities are accessed by a curved boulevard style roadway which, while also dissecting the site from east to west, follows the natural contours of the land at this location. Substantial green/planted buffer zones are proposed around all areas of development within the campus. The playing pitches proposed along the northern site boundary with the county road in Scenario 1 are eliminated and the existing habitat at this location is left largely untouched. This is proposed in order to both maintain existing biodiversity and to function as a facility within the scheme for more passive forms of recreation. This area in turn is connected to the east and west by a pathway that skirts the northern boundary of the Business and Enterprise/Hotel and Conference Campus to two similar untouched areas, thereby creating a type of linear nature and amenity park.

As with Scenario 1, all utilities are located at the western end of the Business and Enterprise Campus, apart from the surface water attenuation pond, which is relocated to the north eastern corner of the campus. At this location the pond can also function more readily as an amenity feature for campus employees, visitor, and users of the hotel and conference centre. Furthermore, the relocation of the attenuation pond to the north eastern end of the campus frees up additional lands adjoining the western boundary to accommodate an increase in the area allocated for the location of an extension to photo-voltaic park on the southern side of the primary county road, as proposed in Scenario 1.

This scenario limits the amount on business and enterprise development along the northern boundary with local road thereby restricting to a greater degree any impact on the residential amenity of existing dwelling houses along this road.

This scenario also proposes the provision of a 50 be Hotel and Conference Centre and low-rise budget airport accommodation facility on the Airside, immediately to the east of the roundabout at the proposed entrance to the Business and Enterprise Campus.

Key Elements of Scheme

- Parkland design with less hard surfacing and greater use of existing site contours.
- Minimises land take and associated loss of habitats and conserves biodiversity
- Limiting development close to existing residences along tertiary county road to the north.
- Greater preservation of existing habitats within the scheme and the creation of additional natural areas suitable for passive recreation.
- Greater area set aside for photo-voltaic energy production.
- Area designated for budget accommodation facility on Airside.
- 50 bed Hotel and Conference Centre, with room for expansion.

6.4 Testing the SDZ Plan Alternatives

The two identified alternatives have been identified as per Section 6.3. The two scenarios have been assessed against the Environmental Protection Objectives (EPOs) set for each of the environmental topics.

SEA Topic	Environmental Protection Objectives
Biodiversity, Flora and Fauna	**B1:** Conserve and protect designated habitats and protected species.
	B2: Maintain the biodiversity of interdependent habitats and species in the wider landscape
Population and Human Health	**HP1:** To improve the working populations quality of life based on a high-quality working environment, reduction in commuting distance and the promotion of sustainable modes of transport within, to and from Ireland West Airport Knock
	HP2: To protect human health from incompatible land uses associated with locating at or adjoining airports.
Soils and Geology	**SG1:** To identify and protect areas which may be deemed to have a risk of landside
Water	**W1:** To prevent deterioration of surface waters of good and high status
	W2: To restore states of water bodies of moderate, poor and bad to good status
	W3: To reduce surface water pollution from priority substances
	W4: To achieve water-related designated protected area objectives and to support the achievement of favourable conservation status wherever such plans exist
Air Quality	**AR1:** Maintain good air quality status in line with CAFÉ Directive requirements and the National Climate Change Strategy.
Noise	**N1:** To promote appropriate noise control measures on operations within the Ireland West Airport Knock Planning Scheme area.
	N2: To encourage the implementation of control measures on road traffic noise within the Ireland West Airport Knock Planning Scheme area
Climate	**C1:** To maximise the areas contribution to the national decrease in Green House Gases

Flooding	**F1:** To prevent development on lands which pose – or are likely to pose in the future – a significant flood risk.
Roads & Transport Infrastructure	**R1:** To protect the road network
	R2: To prevent any interference with the safety and efficiency of aircraft operations in the vicinity of the airport.
Energy	**E1:** To reduce the reliance on non-sustainable energy sources by the promotion and use of renewable energy resources
Waste Water	**WW1:** To provide adequate wastewater infrastructure to meet existing and future demands for such provision
Drinking Water	**DW1:** To prevent deterioration of the status of water bodies with regard to quality, quantity and to improve water body status of rivers, lakes and groundwater to at least good status as appropriate to the WFD, providing good sources of abstraction for drinking water.
Waste Management	**WM1:** Minimise waste production and maximise recycling and recovery through the introduction of sustainable waste management practices.
Archaeological Heritage	**CH1:** To protect the archaeological heritage and especially sites identified in the Record of Monuments and Places, National Monuments in the ownership or guardianship of the State and National Monuments that are subject to Preservation Orders and to safeguard the integrity of the archaeological sites in their setting.
	CH2: To protect the architectural heritage of County Mayo with regard to protected structures, Architectural Conservation Areas and other elements highlighted in the baseline date in Section 4.
Landscape	**L1:** To protect the landscape character of the area.

The alternatives were evaluated using compatibility criteria in order to determine how they would affect the status of the EPOs. The EPO's and the alternative scenarios are arrays against each other to identify which interactions- if any would cause effects specific components of the environment.

The table and below contains the detail of the evaluation of the alternatives as tested against each of the Environmental Protection Objectives using the following key.

√√	Very Significant Beneficial Impact on the status of the Environmental Protection Objective
√	Potentially Significant Beneficial Impact on the status of the Environmental Protection Objective
0	No Relationship with or an Insignificant Impact on the status of the Environmental Protection Objective
X	Potentially Significant Adverse Impact on the status of the Environmental Protection Objective
XX	Very Significant Adverse Impact on the status of the Environmental Protection Objective
?	Unknown Impact on the status of the Environmental Protection Objective

6.5 Assessment of Alternatives with EPO's

Environmental Receptor EPO	Alternative 1- Urban Style Development	Alternative 2- 'Green' Parkland Style Development (Preferred Scenario)
Biodiversity, Flora and Fauna		
B1: Conserve and protect designated habitats and protected species. **B2:** Maintain the biodiversity of interdependent habitats and species in the wider landscape.	More rigid and urban style layout leading to greater hard surfacing and consequent loss of habitats and species. Proposal for complex of playing pitches will lead to greater loss of natural habitat. Greater fragmentation within the scheme leading to less effective ecological corridors. The proposal to develop a complex of playing pitches on the main area of open space within the Business and Enterprise Campus will impact negatively on the maintenance of the biodiversity of interdependent habitats and species in the wider landscape.	Less formal and rigid layout with less hard surfacing results in greater preservation of existing habitats. Creation of a series of linked natural areas will minimise fragmentation of ecological corridors. Greater preservation of existing habitats within the scheme. Greater connectivity between existing green spaces. There are opportunities in this scenario to provide for new networks of open space and green corridors.
	X	√√
Population and Human Health		
HP1: To improve the working populations quality of life based on a high-quality working environment, reduction in commuting distance and the promotion of sustainable modes of transport within, to and from Ireland West Airport Knock. **HP2:** To protect human health from incompatible land uses associated with locating at or adjoining airports.	By providing a complex of playing pitches on the largest area of open space, this scenario provides greater opportunities for participation in team sports and all the benefits that such activity provides for both working and visiting populations to the area. Lessens opportunities to provide for a network of green spaces and opportunities for passive recreation for both employees and the wider population.	The less formal layout and greater provision of natural and planted areas provides a good quality of recreational open space for the working and visiting population to the area. Layout provides greater opportunities for promotion of cycleways and walkways for internal circulation within the plan area and walking routes and segregated cycle and pedestrian routes. The proposal to provide a network of green spaces increases opportunities for passive recreation for both employees and the wider population. The location of the proposed surface water attenuation pond provides greater opportunity to also function as an amenity feature.
	√	√√
Soils and Geology		
SG1: To identify and protect areas which may be deemed to have a risk of landside.	The Hotel and Conference centre is proposed in a very elevated part of the site. significant cut and fill would be required. The proposed central avenue is cut into the contours of the existing landscape requiring a significant amount of cut and fill.	The curved central access road follows the natural contours of the site at this location thereby minimising the extent of cut and fill required, thereby lessening the potential for landslides.
	XX	√√
Water		

W1: To prevent deterioration of surface waters of good and high status. **W2:** To restore states of water bodies of moderate, poor and bad to good status. **W3:** To reduce surface water pollution from priority substances. **W4:** To achieve water-related designated protected area objectives and to support the achievement of favourable conservation status wherever such plans exist.	The more urban form, with greater emphasis on hard-surfacing in this scenario increases the necessity for the creation of surface water attenuation methods and lessens the opportunity for natural surface water attenuation through natural green areas.	This scenario provides greater scope for natural surface water attenuation due to the greater preservation of existing green areas proposed allowing for greater level of natural surface water attenuation
	√	√√
Air Quality		
AR1: Maintain good air quality status in line with CAFÉ Directive requirements and the National Climate Change Strategy.	No relationship with or any significant impact on the status of the Environmental Objective.	Green belts are proposed as a method for air purification. This scenario allows for an additional area for the development of a photo-voltaic energy park thereby maximising use of non-polluting renewable energy sources.
	0	√
Noise		
N1: To promote appropriate noise control measures on operations within the Ireland West Airport Knock Planning Scheme area. **N2:** To encourage the implementation of control measures on road traffic noise within the Ireland West Airport Knock Planning Scheme area.	No relationship with or any significant impact on the status of the Environmental Objective.	The layout has been designed to ensure that compatible developments are located in the appropriate campuses. This scenario is designed to incorporate a green belt- method used to combat the level of noise as there will be intermittent noise from aircrafts and road traffic.
	0	√
Climate		
C1: To maximise the areas contribution to the national decrease in Green House Gases.	Scenario includes proposals for the development of a photo-voltaic energy creation park adjacent to the proposed services area.	This scenario allows for greater provision of alternative sustainable energy technology by the provision of an additional area for the location of photo-voltaic energy generation to the north of the Primary local Road.
	√	√√
Flooding		
F1: To prevent development on lands which pose – or are likely to pose in the future – a significant flood risk.	No relationship with or any significant impact on the status of the Environmental Objective.	The less ridged parkland style layout allows for greater preservation of existing green areas allowing increased levels of natural surface water attenuation.
	0	√
Roads & Transport Infrastructure		

R1: To protect the road network. **R2:** To prevent any interference with the safety and efficiency of aircraft operations in the vicinity of the airport.	No relationship with or an insignificant impact on the status of the EPO.	No relationship with or an insignificant impact on the status of the EPO.
	X	√
Energy		
E1: To reduce the reliance on non-sustainable energy sources by the promotion and use of renewable energy resources.	A reduced area for the photo-voltaic solar farm is proposed.	In this scenario a larger photo-voltaic solar farm of 8.23 Ha is proposed, this will allow for the promotion of greater levels of energy efficiency in the plan area.
	√	√√
Wastewater		
WW1: To provide adequate wastewater infrastructure to meet existing and future demands for such provision.	Development will only occur if there is sufficient wastewater provision, therefore the realisation of the Planning Scheme will require implementation as outlined in the planning scheme document.	Development will only occur if there is sufficient wastewater provision, therefore the realisation of the Planning Scheme will require implementation as outlined in the planning scheme document.
	0	0
Drinking Water		
DW1: To prevent deterioration of the status of water bodies with regard to quality, quantity and to improve water body status of rivers, lakes and groundwater to at least good status as appropriate to the WFD, providing good sources of abstraction for drinking water.	A number of specific objectives have been included in the Planning Scheme to ensure that future development takes place only with supporting infrastructure in place and also measures included to ensure compliance with the EU Water Framework Directive, implementation of Programme of Measures under the Western Region Drainage Basin plan.	A number of specific objectives have been included in the Planning Scheme to ensure that future development takes place only with supporting infrastructure in place and also measures included to ensure compliance with the EU Water Framework Directive, implementation of Programme of Measures under the Western Region Drainage Basin plan. Greater provision of green areas and thereby increased level of natural surface water attenuation.
	0	√
Waste Management		
WM1: Minimise waste production and maximise recycling and recovery through the introduction of sustainable waste management practices.	A recycling facility is proposed on this site, it will encourage for the removal of waste in a sustainable manner.	The construction of central access road utilising the natural contours of the site will minimise the extent of cut and reduce the amount of waste material to be disposed of off-site.
	√	√
Archaeological Heritage		
CH1: To protect the archaeological heritage and especially sites identified in the Record of Monuments and Places, National Monuments in the ownership or guardianship of the State and National Monuments that are subject to Preservation Orders and to safeguard the integrity of the	No relationship with or any significant impact on the status of the Environmental Objective.	No relationship with or any significant impact on the status of the Environmental Objective.

archaeological sites in their setting.	0	0
Landscape		
L1: To protect the landscape character of the area.	The boundary of the Planning Scheme will be planted to add screening and to integrate the SDZ into the surrounding rural landscape. There are some landscaped areas plotted around the some of the developments. A forest park is proposed to screen the wastewater treatment plant. The green roofs proposed allow for developments to be incorporated into the existing landscape.	This scenario gives more flexibility in terms of siting and design to best develop the Business and Enterprise campus and Hotel and Conference facilities so that it can encompass all aspects of best practice in order to develop that lands to ensure minimal impact on the landscape character of the area. It ensures that the hill which screens the airport terminal is maintained. This is a distinctive feature which could be landscaped to give a 'sense of arrival' at the Airport. Expansive landscaped areas are planned. Opportunities to incorporate open spaces and green corridors in the area. The campus style approach for the Planning Scheme results in a greater amount of soft and natural landscaping which assimilates the scheme into the existing and surrounding rural landscape. Ensuring any new developments will not intrude on the surrounding landscape. This is most especially true in relation Business and enterprise campus to the North of the Regional Road.
	√	√√

6.6 Summary of Assessment of Alternatives

Environmental Protection Objective	Alternative 1 'Urban' Style Campus	Alternative 2 'Green' Campus
Biodiversity, Flora and Fauna (B1, B2)	X	√√
Population and Human Health (HP1, HP2)	√	√√
Soils and Geology (SG1)	XX	√√
Water (W1, W2, W3, W4)	√	√√
Air Quality (AR1)	0	√
Noise (N1, N2)	0	√
Climate (C1)	√	√
Flooding (F1)	0	√
Roads & Transport Infrastructure (R1, R2)	0	√
Energy (E1)	√	√√
Wastewater (WW1)	0	0
Drinking Water (DW1)	0	√
Waste Management (WM1)	√	√
Archaeological Heritage (CH1)	0	0
Landscape (L1)	√	√√

6.7 Selection of Preferred Scenario

Two options were assessed, the SDZ Planning Scheme site is underpinned by the zonings of the LAP for IWAK therefore the planning scheme. Therefore,

The preferred scenario was determined by assessing both alternatives against the Environmental protection Objectives derived as part of the SEA Process. This process resulted in Scenario no. 2 emerging as the most sustainable overall. Scenario No. 2 offers more scope to locate development in areas with less impact on the environment. It also offers a greater area for the development of renewable energy infrastructure and indicates greater cognisance of public amenity.

Section 7: Evaluation of Planning Scheme for the SDZ

7.1 Introduction

In this section the policies and objectives of the draft planning scheme are assessed against the Environmental Protection Objectives established in Section 5. The objective of the EPO's policies and objectives of the draft planning scheme is to determine the environmental effects of implementing the planning scheme. The process of evaluation of the detailed policies and objectives enables the likely significant effects on implementing the planning scheme to be identified and also for mitigation measures to be incorporated into the planning scheme where appropriate to address adverse impacts.

SEA is an interactive process, with some of the policies evaluated in the matrix below.

- Chapter 1- Introduction – Gives the background introduction of the Planning Scheme area and looks at the area it is today, the context of Ireland West Airport Knock.
- Chapter 2- Planning Scheme Framework- Describes the strategies and proposed land use and development for IWAK.
- Chapter 3- Development Districts and Development Areas- Explains the Planning Scheme in detail and provides details of design specifications, aims and challenges associated with each area.
- Chapter 4- Phasing, Implementation and Monitoring- Sets out the implementation and monitoring for the Planning Scheme.
- Chapter 5- Minimising Adverse Effects on the Environment- Provides the SEA, SFRA and AA summary for the Planning Scheme.

The planning tools used are contained in chapters 2&3. These chapters have been informed by the other chapters in the plan, the SEA, AA and Flood Risk Assessment. In relation to the screening matrices for the Planning Scheme, these 2 chapters were deemed necessary to screen (Chapters 2&3).

Chapter 2 sets out the overall aims for the Planning Scheme therefore has been screened. The chapter is subdivided into a number of sections:

i. Land Use and Development
ii. Movement and Transport
iii. Green Infrastructure, Biodiversity and Natural Heritage
iv. Economics
v. Built Form and Development
vi. Services, Infrastructure and Energy

Chapter 3 is also screened as this chapter sets out the development and requirements of the Development Areas and Development Districts. All 4 development areas were assessed.

This evaluation assesses the likely or potential significant effects on the environment i.e. on biodiversity, flora and fauna, population and human health, water, air, climatic factors, material assets, cultural heritage, and soils and landscape, of implementing the Planning Scheme.

7.2 Evaluation Methodology

The methodology used to complete the assessment of the Planning Scheme document comprised of creating a matrix whereby the principles of the Planning Scheme are listed on one axis and the Environmental Protection Objectives on the other. The principles of the Planning Scheme were tested against the Environmental Protection Objectives developed earlier in the SEA process.

To avoid the Environmental Report being dominated by a series of complex matrices these detailed matrices have been included as an Appendix (see Appendix 5). Potential beneficial and adverse impacts have been identified in line with the requirements of the SEA Directive. Potential effects of plan policies have been categorised as:

Potential to have:

- Very Significant Beneficial Impact on EPO (√√)
- Potentially Significant Beneficial Impact on EPO (√)
- No Relationship with or an Insignificant Impact on EPO (0)
- Potentially Significant Adverse Impact on the status on EPO (X)
- Very Significant Adverse Impact on the status on EPO (XX)
- Unknown Impact on the status on EPO (?)

7.3 Potential Impact of the Planning Scheme (SDZ) on Biodiversity, Flora and Fauna

The Planning Scheme encourages opportunities for new habitats to be created and the improvement existing habitats through inclusion of initiatives such as a green infrastructure strategy. This strategy aims to provide for greater connectivity by providing green routes through each of the districts. It is a requirement of the Planning Scheme to ensure that each route contains certain types of planting, considering the airport location and the issue of aircrafts and bird strikes. Lands in the vicinity of the Planning Scheme area consists generally of bog land habitat, which is considered an important element in defining the character of the area.

Providing green routes in the area also assists in fulfilling the biodiversity principles of expanding ecological networks in the area. SuDS measures are also a fundamental element of the green infrastructure of the Planning Scheme and could have potential significant, long-term beneficial impacts on this environmental receptor. Other features included in the design of the Planning Scheme include the use of green roofs and walls, these will have significant beneficial impacts on both biodiversity and water quality in the area.

While the majority of principles will serve to have significant positive impacts on biodiversity, those objectives that encourage greater use by people of natural and man-made recreational assets and promote the development of walking and cycle routes through, or alongside them, may have the potential to have adverse impacts on biodiversity through the disturbance and/or destruction and/or fragmentation of habitats.

Mitigation is necessary in order to offset any potential adverse impacts on implementing the Planning Scheme.

The IWAK Wastewater Treatment Plant is currently operating under capacity and has the option to expand to double its current capacity.

During construction phases, development is likely to have direct negative impacts upon fauna and flora in the area. Direct impacts will arise as the result of removal vegetation. Indirect impacts related to the construction phases may occur outside of the site during construction, sediment or contaminated run-off from the site may occur in the water bodies and cause a decline in water quality and effects may be potentially affect water quality downstream from the Sonnagh River to the River Moy. if effects are significant. In terms of the operation phases, positive impacts will be achieved by effective landscape proposals and implementation of SuDS techniques, and new green routes/spaces, which will increase the overall diversity of vegetation in the area. Short term construction works may have a negative impact on biodiversity; however, it is considered that these potential impacts as a result of construction taking place are more appropriately dealt with at project stage, either by way of a planning application and/or an Environmental Impact Assessment (EIA) and/or an Appropriate Assessment (AA).

7.4 Potential Impact of the Planning Scheme (SDZ) on Population and Human Health

Land use planning impacts on the everyday lives of people and can promote healthy sustainable environments and communities. For example, the provision of safe walking routes and cycle-ways will result in direct and indirect benefits to employees working in the Planning Scheme area. (*Proposals in Section 2.2 Movement and Transport Strategy, Green Infrastructure, Biodiversity and Natural Heritage).* The Planning Scheme creates positive direct effects on this parameter due to promotion and design of pedestrian and cycle friendly movement. Over 25 hectares of Green Infrastructure will be provided on the Planning Scheme lands.

The principles contained in this Planning Scheme for the IWAK SDZ have been found to have an overall significant/ very positive long-term impacts on population and human health. The Planning Scheme also sets out proposals to develop greenfield lands to the north of the airport which will help in creating a more positive economic environment in the Planning Scheme area and region. In the long term it is aim of the Planning Scheme that the area will become a thriving employment campus. The Planning Scheme sets out to encourage employment at IWAK and the surrounding region. The presence of an airport in the region acts as a magnet to draw people and investment to the region, not only facilitating travel and tourism but also a key player in driving economic activity in the form of business and investment. IWAK plays a major part in the transport infrastructure for the west, acting as an international gateway to the West of Ireland, North West and Midlands areas. At a regional level, IWAK serves as an essential aviation and public transportation hub linking the West and Northwest to international destinations with the potential to act as major economic catalyst for generating vital direct and indirect employment and investment.

During the construction phase employment will be provided to the local community and will reach to a regional scale, which will benefit population and human health positively. Other policies contained in the planning scheme that will serve to have significant beneficial impacts on population and human health are those that propose improvements to infrastructure and movements, those promoting green infrastructure corridors running through the area and into the surrounding areas, thereby encouraging greater awareness and enjoyment of the area's natural and built heritage.

Overall, the SDZ Planning Scheme is likely to improve the status of the EPO's on population and human health. The SDZ Planning Scheme promotes environmental protection, energy efficiency, and balanced with economic vitality.

7.5 Potential impacts of implementing the Planning Scheme SDZ on Soils and Geology

Soil quality and function may be enhanced through particular measures associated with water quality and land use and achieving the Water Framework Directive Objectives. The quality of groundwater is directly related to soil quality and land use, and abstraction of geological and soil resources can also affect the water table over time.

The most significant soil and geology effect identified relates to the greenfield development. Planting, retention of historical hedgerows where possible and green infrastructure (see *section 2.3 Green Infrastructure, Biodiversity and Natural Heritage*), will minimise effects associated with considerable development.

As with water resources, additional measures are recommended to ensure stronger protection of soil and geology during the construction phases of the SDZ Planning Scheme.

7.6 Potential Impacts of Implementing the Planning Scheme SDZ on Water

For the purposes of this SEA "water" was an EPO. It refers to the surface water bodies and their quality. The Planning Scheme places emphasis on high quality and sustainable development over the lifetime of the plan and beyond. The environmental assessment of the Planning Scheme has found that the scheme has the potential to have significant adverse impacts, as well as significantly beneficial impacts on water quality. There is provision to upgraded as required the existing wastewater infrastructure in the Planning Scheme.

The plan proposes the implementation of tree planting and soft landscaping schemes, provision of new green areas, and the incorporation of SuDS measures and green roofs green roofs in all new developments. While construction, demolition and operational phases may also have potential for negative impacts on water, it is considered more appropriate that these potential impacts be dealt with at project stage, either by way of a planning application and/or an Environmental Impact Assessment

In terms of flood risk management, a leading policy for the reduction of flood risk in the area will be the use of Sustainable Urban Drainage Systems (SUDS). This technology will reduce run-off rates from newly paved area and hence reduce the risk of potential flooding. The policy encourages the use of green roofs, rainwater recycling, soak ways/infiltration devices and other methodologies that reduce peak storm water run-off.

7.7 Potential Impacts of Implementing the Planning Scheme SDZ on Air Quality & Noise

The Planning Scheme for the SDZ was found to have potential for both significant beneficial and adverse effects on air quality and noise levels. It was found that there was potential for significant adverse effects from some objectives promoting significant amounts of new development in the Planning Scheme area.

At a strategic level, the environmental assessment of the Planning Scheme for the SDZ area has been found to have potential for significant beneficial impacts on the SDZ area overall and into the long term. There is potential, by pursuing the vision outlined in *Section 2.2 of the Planning Scheme; Movement and Transport,* to reduce in time, air emissions by encouraging a modal change from travel using the private car to more sustainable forms of transport such as public transport, walking and

cycling. Promoting such a strategy is in keeping with the policy at national, regional and county planning policy.

It is recognised that increasing the amount of development in an area at a local level, will increase the amount of road traffic in the vicinity. This increase is one of the biggest threats to air quality, in terms of the levels of Nitrogen Oxides and Particulate Matter in the atmosphere. This increase would also impact on noise levels. While construction, and operational phases may also have potential to impact negatively on both air quality and noise levels experienced, it is more appropriate that these potential impacts be dealt with at project stage, either by way of a planning application and/or an Environmental Impact Assessment (EIA) and/or an Appropriate Assessment (AA).

7.8 Potential Impacts of Implementing the Planning Scheme on Climatic Factors

The Planning Scheme was found to have mostly significant impacts on the emission of greenhouse gases within the SDZ area. In the long term, the concentration of development in the area with a mix of uses, has the potential to improve public transport options. Allied to this, attractive pedestrian and cycle options will also reduce the potential greenhouse gas emissions.

Overall the SDZ Planning Scheme will contribute positively to climate change adaptation through the following:

- provision of Nearly Zero Energy Ratings in new developments;
- Surface Water Strategy and green infrastructure giving rise to increased surface water storage and potential carbon sequestration;
- Retention of hedgerows and provision of new planting regimes to further enhance carbon sinks (existing and new),
- Longer term positive effects in relation to air quality, population and human health and water.
-

7.9 Potential impacts of implementing the Planning Scheme SDZ on Material Assets.

The Planning Scheme was found to have generally significant beneficial impacts on material assets, with none of the principles were found to have any significant adverse impacts on material assets, i.e. transport and waste management.

The provisions for transport included in Section 2.2 *Movement and Transport* are of particular relevance. Material Assets are likely to create many positive impacts for a number of EPO's including population and human health, air quality and climate. Several transport measures (in particular public transport and walking and cycling) create positive impacts as they support more sustainable transport options with cumulative and in combination positive impacts relating to human health, biodiversity and air quality. *Section 2.4- Economics* promotes employment within the Planning Scheme.

Water supply and wastewater capacity and demands are addressed in conjunction with Irish Water. The key element in relation to this is ensuring the implementation of the SDZ Planning Scheme is in line with capacity to treat wastewater and prove an adequate potable water supply.

7.10 Potential impacts of implementing the Planning Scheme SDZ on Landscape

The environmental assessment found that the parkland style layout of the Planning Scheme will, overall, have a significant beneficial impact on landscape.

The tree planting and SuDS features will provide an attractive landscape to cater for the employees working in the Planning Scheme, it will further aid in in screening development and act as noise minimisation features.

7.11 Possible Cumulative Effects with other Plans and Projects

This section of the Environmental Report provides an outline of the potential cumulative effects on the environment as a result of implementation of the SDZ Planning Scheme.

Cumulative effects are referred to in a number of SEA Guidance documents and are defined in the EPA SEA Process Checklist as "e*ffects on the environment that result from incremental changes caused by the strategic action together with other past, present and reasonably foreseeable future actions. These effects can result from individually minor but collectively significant actions taking place over time or space"*[3] These effects can be insignificant individually but cumulatively over time and from a number of sources can result in the degradation of sensitive environmental resources. The assessment of cumulative effects is a requirement of the SEA Directive (2001/42/EC).

The 2004 Guidelines produced by the DECLG outlines that the SEA process is in a good position to address cumulative effects for which the Environmental Impact Assessment process is not equipped to deal with. Due to the strategic nature of the SEA process a forum is provided in which cumulative effects can be addressed. The EPA is presently undertaking a study in relation to cumulative effects and it is anticipated that a draft Cumulative Effects – Best Practice Guidance Document will be available soon to SEA practitioners.

The EPA Strive Report 2007-2013 on 'Integrated Biodiversity Impact Assessment' describes cumulative effects as incremental effects resulting from a combination of two or more individual effects, or from an interaction between individual effects – which may lead to a synergistic effect (i.e. greater than the sum of the individual effects), or any progressive effect likely to emerge over time.

Cumulative Effects on Other Plans

Plan	Comment	Cumulative Effects
Neighbouring County Development Plans	These plans were subject to full SEA and AA and concluded that subject to full adherence and implementation of measures likely significant effects were not identified.	No in-combination impacts were predicted as a result of implementation of the Plans
Water Services Strategic Plan	Ireland's first integrated national plan for the delivery of water services, the Water Services Strategic Plan (WSSP) addresses six key themes and was adopted in 2015. It was subject to full SEA and AA and concluded that Overall, the assessment has identified that the implementation of	No in-combination impacts were predicted as a result of implementation of the Plans

[3] (EPA SEA Process Checklist (2011)

	the draft WSSP is likely to have positive effects on the majority of the SEOs that have been used in the assessment to help characterise the environmental effects of the WSSP and no significant negative effects were identified.	
CFRAMS Study	The study has been commissioned in order to meet the requirements of the Floods Directive, as well as to deliver on core components of the 2004 National Flood Policy	Surface Water Strategy for SDZ Planning Scheme addresses and makes recommendations in relation to this. No adverse effects identified.
River Basin District Management Plans.	The second cycle of these plans (2015 to 2021) are currently in preparation and will provide management measures to achieve WFD Objectives up to 2021. This plan is undergoing both SEA and AA and is in draft form.	No in-combination impacts are predicted as a result of implementation of the Plans

Section 8: Mitigation Measures

8.1 Introduction

Mitigation is a measure to avoid/prevent, minimise/reduce or as fully as possible offset/compensate for any adverse effects on the environment as a result of implementing a plan. Mitigation involves ameliorating significant negative effects. Where there are significant negative effects, consideration is given in the first instance to preventing such effects or, where this is not possible for stated reasons, to lessening or offsetting those effects. Mitigation measures can be roughly divided into those that avoid effects; reduce the magnitude or extent, probability and/or severity of effect; repair effects after they have occurred, and; compensate for effects, balancing out negative impacts with other positive ones.

In addition to the mitigation measures detailed below, additional more detailed mitigation measures may also be required through the development management process (i.e. the planning application stage). The mitigation measures will be incorporated into the development management standards and guidance of the IWAK SDZ Planning Scheme and will assist in assessing planning proposal within the SDZ Planning Scheme area.

Mitigation Measures

Bio-diversity, Flora and Fauna

Mitigation 1	All development proposals with the potential to impact on Natura 2000 sites will be subject to Habitat Directive Assessment under Article 6(3) and 6(4) of the Habitats Directive
Mitigation 2	All development proposal shall include an Ecological Assessment where it is considered that it may have an adverse impact on the environment of a designated site (Appendix 2)
Mitigation 3	All development proposals should prevent the spread of, aquatic and terrestrial, invasive and alien species

Population and Human Health

Mitigation	Measure
Mitigation 1	Develop design guidelines that represent a preferred set of standards that contribute to achieving quality development, in particular: • contemporary building design will be encouraged. Building materials should be of a high quality and the buildings should allow for some transparency to the activities of the interior • to accomplish development, which is responsive to the context, in particular the landscape character • to ensure that future development contributes to the creation of a high-quality landscape environment on the site, by achieving a high-quality parkland type development scheme. • to encourage sustainability objectives through environmentally responsible architectural design • to create a focus for a wide variety of businesses that offers employees and visitors an attractive environment, that compliments and connects business activities with each other, and with high quality public space
Mitigation 2	Compliance with the Public Safety Zone, Obstacle Limitation and Noise Contour requirements (Appendix 1)

Soils and Geology

Mitigation	Measure
Mitigation 1	All development proposals that require peat or vegetation removal shall prepare a peat management and disposal plan. (Appendix 2)
Mitigation 2	Where development proposals involve the excavation of peat and soft soils on slopes a geotechnical assessment of the potential risk of landslides should be prepared. (Appendix 2)

Water

Mitigation	Measure
Mitigation 1	There should be full and strict compliance with the programme of measures developed to achieve the specific objectives of the Western River Basin Management Plan, in addition to enforcement of / compliance with local legislation and plans (RMCEI*, bye-laws and Water Management Unit specific measures), national and EU legislation.
Mitigation 2	A Habitats Directive Assessment (post screening) will be required to assess the potential adverse impacts of any plan or project, where considered appropriate, either individually or in combination with other plans or projects on a European Site, including SACs, SPAs and also RAMSAR sites (classified under the RAMSAR Convention, 1971) within or pertaining to the Plan Area. This should include waste assimilative capacity predictions to ensure that the capacity of existing surface waters is sufficient to accept new / increased discharges with no deterioration in current water body status.
Mitigation 3	Surface Water Management Plan should be prepared for all development proposals (Appendix 2)

Air and Climate Factors

Mitigation	Measure
Mitigation 1 (Air)	Prepare a dust minimisation plan for any development proposal

Mitigation 2 (Climate)	All development proposals should include means to reduce the carbon footprint of the development scheme through innovate design and site layout solutions as well as implementing efficiency and renewable energy technologies. Development proposals should: • combine energy efficiency measures with renewable energy technologies and resource consumption plans and examine features such as: ○ building fabric ○ heating ○ hot water controls ○ combined heat and power ○ ventilation and air conditioning ○ powering pumps and fans ○ lighting controls ○ office/catering equipment ○ transport requirements
Mitigation 3 (Noise)	Comply with Noise Contour requirements (Appendix 1)
Mitigation 4 (Noise)	Factor in noise barriers and noise protection into the building and site layout design
Mitigation 5 (Flooding)	All new development proposals within or close to flood risk areas shall submit a flood risk assessment which should incorporate flood protection and mitigation measures, as appropriate.

Material Assets

Mitigation	Measure
Mitigation 1 (Road network)	Assess the adequacy of the road network in the SDZ area in terms of capacity, width, alignment or surface condition in order to cater for increased traffic. Any deficiencies identified should be addressed within a reasonable timeframe by the relevant authority
Mitigation 2 (Road Network)	Use of shared access points onto the public road network
Mitigation 3 (Energy)	Encourage the use of energy efficiency in all new development proposals, with the ultimate aim of achieving a Carbon Neutral Status
Mitigation 4 (Energy)	Reduce energy consumption through innovative design and layout with the appropriate use of materials and new technology in developments proposals
Mitigation 5 (Waste Management)	Prepare a waste management plan for construction and demolition projects
Mitigation 6 (Waste Management)	Prepare an Operation Waste Management Plan to minimise waste production and maximise recycling and recovery through the introduction of sustainable waste management practices in all development proposals (Appendix 2)
Mitigation 7 (Drinking Water)	Prepare Surface Water Management Plan to ensure that any discharges to ground waters do not cause deterioration in the current water body status

Cultural Heritage

Mitigation	Measure
Mitigation 1 (Archaeological)	In order to safeguard the integrity of the archaeological sites in their setting in the landscape an archaeological assessment shall be submitted for: • planning applications that fall within the zones of archaeological potential as outlined on the Record of Monuments and Places

	• all significant planning applications (i.e. development of lands on 0.5ha or more than 1km or more in length) (Appendix 2)
Mitigation 2 (Architectural)	Provide an architectural and urban design palette that contributes to achieving quality development, in particular: • contemporary building design will be encouraged. Building materials should be of a high quality and the buildings should allow for some transparency to the activities of the interior • to accomplish development, which is responsive to the context, in particular the landscape character • to ensure that future development contributes to the creation of a high-quality landscape environment on the site, by achieving a high-quality parkland type development scheme. • to encourage sustainability objectives through environmentally responsible architectural design • to create a focus for a wide variety of businesses that offers employees and visitors an attractive environment, that compliments and connects business activities with each other, and with high quality public space
Mitigation 3 ((Architectural)	Retain, were possible, of all features of historic, architectural or natural interest, such as stone walls, hedgerows and/or bridges or other features.

Landscape

Mitigation	Measure
Mitigation 1	All proposed development should be designed to absorb into the surrounding landscape so that it does not impinge in any significant way upon the character, integrity or uniformity of the landscape and that all development proposals consider that aspects of access, permeability and open space respond to the key landforms features and rural character of the area
Mitigation 2	Development proposals should contribute to the creation of a high-quality landscape environment by achieving a high-quality parkland type of development scheme.

Section 9 Monitoring Measures

9.1 Introduction

The SEA Directive requires that the significant environmental effects of the implementation of plans and programmes are monitored. This environmental report puts forward proposals for monitoring the implementation of the Planning Scheme.

Monitoring enables, at an early stage, the identification of unforeseen adverse effects and the undertaking of appropriate remedial action. In addition to this, monitoring can also play an important role in assessing whether the Planning Scheme is achieving its environmental objectives and targets – measures which the Planning Scheme can help work towards – whether these need to be re-examined and if the proposed mitigation measures are been implemented. The monitoring programme will consist of assessment of the relevant indicators and targets against the data relating to each environmental component.

9.2 Indicators and Targets

Monitoring is based around indicators which were chosen earlier in the SEA process for the purpose of measuring changes to the various environmental components. They allow quantitative measures of trends and progress over time relating to the EPOs used in the evaluation process. Focus will be given to indicators which are relevant to the likely significant environmental effects of implementing the Planning Scheme and existing monitoring arrangements will be used in order to monitor the selected indicators. Each indicator to be monitored in accompanied by targets which are derived from relevant legislation. Table 23 below shows the indicators and targets which have been selected with regard to the monitoring of the Planning Scheme.

9.3 Data Sources

Measurements for indicators should come from existing monitoring sources and no new monitoring should take place. Existing monitoring sources exist for the indicators and include those maintained by Mayo County Council and the relevant authorities e.g. the Environmental Protection Agency, the National Parks and Wildlife Service and the Central Statistics Office. The Development Management Process will provide passive monitoring of various indicators and targets on an application by application basis.

9.4 Reporting and Monitoring

Mayo County Council, as the Development Agency will be responsible for collating existing relevant monitored data, the preparation of a monitoring report, and recommend appropriate corrective action. It is recommended that a multidisciplinary team of suitably qualified persons be established to oversee the monitoring process. The team will determine the frequency of the monitoring and input into the preparation of the Monitoring Report.

Table 22 Monitoring Table

Environmental Receptor	Targets	Indicators	Source	Frequency of Reporting	Department Responsible
Biodiversity, Flora & Fauna	**Target B1i:** No loss of protected habitats or species. **Target B1ii:** No loss or degradation of locally rare/distinctive habitats/species. **Target B1iii** No loss or fragmentation of ecological corridors	**Indicator B1i:** Number of sites for Nature Conservation to be adversely affected by the implementation of the Planning Scheme. **Indicator B1ii:** Changes in population and range of protected species. **Indicator B1iii:** Number of sites containing locally rare/distinctive species/habitats to be adversely affected by the implementation of the Planning Scheme. **Indicator B1 iv:** Percentage loss of ecological connectivity between areas of local biodiversity as a result of implementation of the Planning Scheme.	Corine Mapping NPWS Records; Development Management Process in Mayo County Council	Annually Annually Annually Ongoing	Forward Planning Forward Planning Forward Planning Forward Planning Forward Planning
	Target B2i: No loss of protected habitats or species.	**Indicator B2i:** Number of sites for Nature Conservation to be adversely	Corine Mapping NPWS Records	Annually	Forward Planning

	Target B2ii: No loss or degradation of locally rare/distinctive habitats/species. **Target B2iii:** No loss or fragmentation of ecological corridors	affected by the implementation of the Planning Scheme. **Indicator B2ii:** Changes in population and range of protected species. **Indicator B2iii**: Number of sites containing locally rare/distinctive species/habitats to be adversely affected by the implementation of the Planning Scheme. **Indicator B2 iv:** Percentage loss of ecological connectivity between areas of local biodiversity as a result of implementation of the Planning Scheme.	Planning Register	Annually Annually Ongoing	Forward Planning Forward Planning Forward Planning
Population and Human Health	**Target HP1i:** Provide a good quality of recreation and green space within the working environment. **Target HP1ii:** reduction in commuting distance within the catchment area.	**Indicator HP1i:** That all development has sufficient recreation and open space for the working and visiting population to the area. **Indicator HP1ii:** reduction in the percentage of persons distance to work that is greater than the distance to the airport from the Census data **Indicator HPiii:** promotion of cycleways and walkways for internal circulation throughout the Plan area and any increase in use of public transport or car	CSO Planning Register Mayo County Council	Annually Periodically	Development Management Department Forward Planning

	Target HP1iii: increase of sustainable transport options including public transport, cycling and walking.	sharing schemes for employees within the area.		Periodically	Forward Planning
	Target HP2i: To ensure that all development complies with the land use requirements of the public safety zones, safeguarding maps and noise contour maps	**Indicator HP2i:** The avoidance of incompatible land uses in the area around the airport.	Mayo County Council Planning Register Health and Safety Authority (HSA)	Ongoing	Development Management Department
Soils and Geology	**Target SG1:** No occurrence of landslides	**Indicator SG1:** Steepness of slopes, moisture content of peat, depth of peat, nature of layer below peat	Geological Survey of Ireland (GSA) Mayo County Council Planning Register	Periodically	Development Management Department, Forward Planning
Freshwater	**Target W1:** No deterioration of surface waters of good and high status	**Indicator W1:** Quality elements for ecological status (biological, hydro morphological, chemical and physic-chemical elements)	WRBD Management Plans Mayo County Council EPA NPWS GSI	Ongoing	Water Services
	Target W2: Achievement of at least good status by 2027 where this is not technically feasible, not environmentally sustainable and / or when restoration costs are disproportionately expensive	**Indicator W2:** Quality elements for ecological status (biological, hydro morphological, chemical and physic-chemical elements)	WRBD Management Plans Mayo County Council EPA NPWS GSI	Ongoing	Water Services
	Target W3: No emissions, discharges or losses of priority substances to surface waters	**Indicator W3:** Chemical and physic-chemical elements of water bodies, in particular, specific pollutants	WRBD Management Plans Mayo County Council	Ongoing	Water Services Environment Department

			EPA NPWS GSI		
	Target W4: No exceedance of specific water quality standards and no deviation from environmental quality objectives established to protect natural habitats and species	**Indicator W4:** Quality elements for ecological status (biological, hydro morphological, chemical and physic-chemical elements)	WRBD Management Plans Mayo County Council EPA NPWS GSI	Ongoing	Water Services Environment Department
Air Quality	**Target AR1i:** Ensure monitoring results are maintained within the appropriate emission limit values. **Target AR1ii:** An increase in the percentage of the people travelling to the airport by public transport. **Target AR1iii:** A decrease in the distance travelled to work/airport by users of Ireland West Airport Knock. A reduction in car dependency will generate a reduction in car-based emissions - increase coach transport, lobby for rail connection. **Target AR1iv:** Increase the number of energy efficient buildings and Co2 neutral developments in the area. Reduce waste of energy and maximise use of renewable energy sources.	**Indicator AR1i:** Air monitoring data to indicate compliance with appropriate policies and legislative requirements. **Indicator AR1ii:** Percentage of workers/airport users travelling to the airport by public transport or non-mechanical means. **Indicator AR1iii:** Average distance travelled to work/airport by the users of Ireland West Airport Knock. **Indicator AR1iv:** No of BER certificates issued for Area. **Indicator AR1v:** No of Co2 neutral developments in the Area	EPA Planning Register	Annually	Environment Department Planning Department

Noise	**Target N1:** Minimise the number of incompatible developments within the various noise contour categories	**Indicator N1:** Number of developments located with the noise contour categories	Mayo County Council	Periodically	Development Management Department
	Target N2: Reduce the percentages of vehicular traffic at Ireland West Airport Knock	**Indicator N2:** Number of traffic movements at Ireland West Airport Knock	Mayo County Council NRA Planning Process	Periodically	Roads Department
Climate	**Target C1i:** Increase the number of energy efficient buildings and Co2 neutral developments in the area. Reduce waste of energy, and maximise use of renewable energy sources **Target C1ii:** To implement the EU Emissions Trading Directive and Irelands National Allocation Plan for Emission Trading to ensure that the Area becomes Carbon Neutral	**Indicator C1i:** Number of BER certificates issued for Area. **Indicator C1ii:** Number of Co2 neutral developments in the Area **Indicator C1iii:** To promote awareness of energy efficient technologies to offset emissions from increased aircraft movements to achieve a carbon neutral area.	EPA SEAI Mayo Energy Agency Planning Register	Annually	Climate Action Department
Flooding	**Target F1:** Minimise developments granted permission on lands which pose – or likely to pose in the future- a significant flood risk	**Indicator F1:** Number of developments granted permission on land which pose – or are likely to pose in the future – a significant flood risk.	OPW Mayo County Council Planning Register	Periodically	Environment Department
Roads & Transport Infrastructure	**Target R1i:** To ensure that all traffic to the area uses the national road network **Target R1ii:** To reduce traffic using the local roads in the area to access the Plan area.	**Indicator R1i:** Increase in traffic movements to and from the area at the junction with the national route. **Indicator R1ii:** Reduction in traffic movements to and from the area via the local road network.	Mayo County Council. NRA Planning Register CSO TII	Periodically	Development Management Department Roads Department
	Target R2: That all development complies with safety requirements and uses are	**Indicator AR2:** Number of development projects permitted with the safety zones around the airport	Mayo County Council Planning Register	Ongoing	Development Management Department

	compatible with location at airports		Health and Safety Authority (HSA) TII		
Energy	**Target E1:** To reduce energy consumption from non-sustainable sources to a minimum by the adoption and use of renewable energy sources.	**Indicator E1:** Increase in renewable energy projects **IndicatorE1ii:** Promotion of energy efficacy in the Plan area	EPA SEAI Mayo Energy Agency Planning Register	Annually	Climate Action Department Development Management Department
Waste Water	**Target WW1i:** To upgrade the existing waste water treatment infrastructure to provide increased capacity for the short--term development **Target C1ii:** To provide new waste water treatment infrastructure for the estimated future development of the area.	**Indicator WW1i:** Upgrade of WWTP from 700 PE to 1400PE capacity **Indicator WW1ii:** Provide now WWTP for 5000 PE capacity	Mayo County Council EPA Appropriate Water Services Authority Planning Register	Annually	Water Services
Drinking Water	**Target DW1i:** No deterioration of the status of waters and restoration to good status of waters currently at moderate, poor or bad status **Target DW1ii:** Comply with the Drinking Water Regulations, 2007 **Target DW1iii:** progressively reduce chemical pollution in waters **Target DW1iv:** Prevent deterioration of and limit pollution inputs to surface water and ground water.	**Indicator DW1i:** Trophic status and faecal coliform count per 100ml of groundwater Indicator DW1ii: drinking water annual report (EPA) **Indicator DW1iii:** Interim water status report in 2017 **Indicator DW1iv:** Long Term water status report in 2027	Mayo County Council EPA Irish Water Planning Register- MCC EPA	Annually	Water Services

Waste Management	**Target WM1i:** 48%recycled 33% energy recovery and 19% landfilled. Attitude change. **Target WM1ii:** All Waste activity is regulated **Target WM iii:** Diversion of bio-waste from landfill and reduction in landfill emissions. **Target WM iv:** All waste activity is regulated.	**Indicator WM1i:** Reduced tonnage of waste collected with increased number of customers **Indicator WM1ii:** Reduction in enforcement actions required Indicator **Indicator WM iii:** Increase in the percentage of customers receiving a refuse collection service and decrease in proportion of waste arising being landfilled and increase in recovery and recycling tonnages	Mayo County Council Planning Register	Annually	Environment Department
Archaeological Heritage	**Target CH1: No** developments carried out over the lifespan of the Proposed Ireland West Airport Local Area Plan which result in the full or partial loss of the archaeological heritage and especially sites identified in the Record of Monuments and Places, National Monuments in the ownership or guardianship of the State and National Monuments that are the subject of Preservation Orders. No developments which result in the full or partial loss of the integrity of the archaeological sites in their setting.	**Indicator CH1:** Number of developments carried out in the Proposed Ireland West Strategic Development Zone which result in the full or partial loss of the archaeological heritage and especially sites identified in the Record of Monuments and Places, National Monuments in the ownership or guardianship of the State and National Monuments that are the subject of Preservation Orders. The integrity of the archaeological sites in their setting can also be impacted upon by new developments	Mayo County Council Department of Culture, Heritage and The Gaeltacht Planning Register	Ongoing	Development Management Department Archaeology Department
Architectural Heritage	**Target CH2i:** No development carried out over the lifespan of the Planning Scheme shall result in the full or partial loss of architectural heritage **Target CH2ii:** No development carried out over the lifespan of	**Indicator CH2i:** The number of developments carried out over the lifespan of the Planning Scheme which result in the full or partial loss of architectural heritage. **Indicator CH2ii:** The number of developments carried out over the	Mayo County Council Department of Culture, Heritage and The Gaeltacht	Ongoing	Development Management Department

	the Planning Scheme will result in the full or partial loss of heritage bridges of Mayo	lifespan of the Planning Scheme which result in the full or partial loss of the heritage bridges of Mayo.			
Landscape	**Target L1i:** To minimise the intrusion of new developments on the landscape character of the area. **Target L1ii:** To minimise the intrusion of exiting development on the landscape character of the area.	**Indicator L1i:** That all development proposals include measures to minimise any intrusion that the development may have on the landscape character of the area. Indicator L1ii: That all development proposal examines if they can introduce measures to reduce the impact of existing structures on the landscape character.	Mayo County Council Corine Mapping	Ongoing	Development Management Department

9.5 Conclusion

This SEA Environmental Report demonstrates how environmental parameters have addressed in the plan preparation process. Consultation has been undertaken for the scoping of this Environmental Report and further opportunity to comment on the Draft Planning Scheme will be possible over the forthcoming weeks.

The preparation of a specific Environmental Management Plan to accompany the SDZ Planning Scheme is the key output of the SEA process and has been developed and refined through the SEA and associated environmental assessment processes to date.

The SEA has been undertaken in line with the Planning and Development (Strategic Environmental Assessment) Regulations 2004-2011 (as amended). The SDZ Planning Scheme was prepared in line with Article 6(3) of the EC Habitats Directive and the accompanying Appropriate Assessment should be read in conjunction with this SEA ER and the Planning Scheme. Subject to the full and proper implementation of the mitigation measures outlines in this SEA Environmental Report and the SDZ Planning Scheme including detailed design at planning application stage, it is considered that significant adverse impacts on the environment will be avoided.

Appendix 1 Public Safety Zones and Noise Contour Maps

Public Safety Zones & Noise Contour Maps

Public Safety Zones (PSZ)

Mayo County Council retained Airport Planning and Development Ltd, in association with DNV Technology and Bickerdike Allen Partnership to prepare public safety zone maps for Ireland West Airport Knock. The methodology used was taken from the approach recommended by the Department of Transport and prepared by ERM in 2005, for the preparation of Public Safety Zones for Dublin Airport, Cork Airport and Shannon Airport.

The report recommends a policy that relates to permissible use to the third-party risk from the possibility of aircraft crashing near an airport. The extent of suitable Inner and Outer Public Safety Zones have been determined for Ireland West Airport Knock. The Inner PSZ extends a maximum of 1325m from the runway thresholds and is never more than 96 metres wide. The Outer PSZ extend a maximum of 5647m from the runway thresholds and is never more that 261m wide

Both the inner and outer public safety zones extend beyond the boundary of the Planning Scheme area. The report gives guidance on the uses normally permitted within the both public safety zones but not all uses are permissible within the Planning Scheme Boundary. This appendix sets out the uses that would normally be permitted within the Planning Scheme boundary.

Inner Public Safety Zones

The extent of permitted development is set below:

1) no further development shall be permitted, and existing development can remain.

2) the only exceptions for permitted development in the inner PSZ are:

- developments where persons are not expected to be present.
- long stay car parks (i.e.) greater than 24 hours, provided that persons are normally expected to park their car and then immediately leave the car park development. Buildings associated with car parks are subject to the guidance in 1 above.
- roads and railways where vehicles and passenger trains / trams are not expected to be stationary. For example, road vehicles can be expected to be stationary at major road intersections, junctions and traffic lights. Therefore, major road intersections, junctions, traffic lights and similar should not be permitted in the inner PSZ

Outer Public Safety Zones

The extent of permitted development within the Planning Scheme is set out below and based on the uses permitted in the ERM Report for Dublin, Cork and Shannon Airports.

1) Existing Development shall remain, and new development shall be considered with following density provisions (including extensions or change of uses):

- **Working Premises** factories, offices and facilities where persons are expected to congregate, such as railway stations. etc
  ≤110 persons per half hectare
- **Limited Use** use not exceeding (approximately) a maximum of 12 hours in one week, Sunday markets, car boot sales day fairs etc
  ≤ 220 persons per half hectare

2) exceptions to permitted development in the outer PSZ
In most cases, the guidance given in 1 above is sufficient to identify whether a proposed development should be permitted in the outer PSZ. However, there may be cases, in exceptional circumstances, where it is judged that developments socio-economic benefits (etc) outweigh the 'safety risk', and that it is impractical for such a development to be located elsewhere:

- Airport Terminals

To ensure risks to people are as low as reasonably practicable, it is desirable to locate airport terminals outside Public Safety Zones. However, this may not be practicable and there are precedents to accept a greater, but tolerable risk, where persons gain a direct benefit from the activity presenting the risk. In the case of an airport terminal, all those involved with using the terminal are receiving a direct benefit (i.e. related to employment or travel) and therefore an annual individual risk greater than 1 in one million (i.e. corresponding to the extent of the outer PSZ) but less than 1 in 100,000 (i.e. corresponding to the extent of the inner PSZ) is considered tolerable. Hence, location of an airport terminal in the outer PSZ is judged tolerable.

- Extensions to Existing Developments

Extensions to existing developments are permitted. This is provided the development is a permitted type and if extended does not result in the density figures listed in 1 above being exceeded.

- Roads and Railways

Roads and railways are permitted in the outer PSZs, including major road and rail intersections, junctions and traffic lights.

- Bus and Rail Terminals

Bus and rail terminals are permitted in the outer PSZs provided the density does not exceed 110 persons per half hectare

- Car Parks

Car parks are permitted in the outer PSZs. This is provided that persons are normally expected to park their car and then leave the car park development. Building associated with car parks are subject to the guidance given in 1 above.

Noise Contour Mapping

Mayo County Council retained Airport Planning and Development Ltd, in association with DNV Technology and Bickerdike Allen Partnership to prepare noise contour maps for Ireland West Airport Knock. The report determined airborne aircraft noise contours based on existing and future aircraft traffic movements as a result of implementation of the Ireland West Airport Knock Planning Scheme. The scope of the work included prediction of noise contours for a 92-day summer period for scenarios based on existing and future movements. The noise contours are predicted based on actual and predicted aircraft movements using the federal Aviation Administration (FAA) Integrated Noise Model (INM) Version 7.0b aircraft noise prediction software. The contour methodology is recognised worldwide and is in accordance with the methodology used for strategic noise mapping under European Directive 2002/49/EC

Guidance on airborne noise levels is taken from the UK Planning Policy Guidance (PPG) 24 Planning and Noise (Department of Environment, 1994) as there is no equivalent noise guidance in Ireland. This guidance mainly deals with residential development, but it has been clarified at recent UK public enquiries for airport development that the PPG24 levels are also useful in considering new airport developments.

The Noise Contour Maps shown include forecast movements for predicted aircraft movements up to the year 2025 using data supplied by the airport. The noise levels contours indicate the impact of daytime aircraft noise in terms of daytime $L_{Aeq,16h}$ noise contours determined from the average summer day aircraft movements. There is no night time noise impact from flights as the airport does not operate through the night except in the case of emergencies, therefore noise disturbance at night is considered minimal.

The following table outlines the development control standard that should be implemented depending where the location fits within the Noise Contours.

Guidance with regard to airborne noise

Noise Contour $L_{Aeq,16h}$, dB	**Guidance for development of building where persons are present.**
< 57	Noise need not be considered as a determining factor in determining a planning application, although the noise level at the high end should not be regarded as a desirable level and advice may be given to ensure adequate protection against noise.
57 - 66	Noise should be taken into consideration when determining a planning application and, where appropriate, conditions should be imposed to ensure an adequate level of protection against noise.
66 – 72	Permission should not normally be granted. Where it is considered that permission should be given conditions should be imposed to ensure a commensurate level of protection against noise.
> 72	Planning permissions should not be permitted

Appendix 2: Environmental Management Report Guidelines

Environmental Management Report Guidelines

In order to access the potential impact of any development proposal on the environmental quality of the area, the requirement for the submission of an EMR shall be agreed with Mayo County Council prior to the submission of a planning application.

The following subsections are a guide as to the content of the EMR. A list of guidance documents and reports are listed in Appendix 7 of this Environmental Report as reference material that may aid in the compilation of the EMR. This is not an exclusive list of documents and others may also be referenced if considered appropriate to the relevant development proposal.

Contents of the Environmental Management Report

The EMR shall examine the development proposal through all three phases of the development process, i.e. planning phase, construction phase and operational phase. The EMR shall examine the potential impact on the environment through all three phases of the development process.

The environmental factors to be examined in the EMR relate to the environmental factors of the Strategic Environmental Assessment process.

Environmental Factors		
Biodiversity, Flora and Fauna	Fresh Water Quality	Soils and Geology
Air, Climate and Energy	Noise	Flooding
Drinking Water and Waste Water	Archaeology and Architectural Heritage	Waste Management
Landscape		

The EMR should be set out in accordance with the details below:

- Description of the development proposal.
- Identification of the environmental factors affected by the development proposal. If it is demonstrated that the development proposal does not affect an environmental factor, this should be clearly shown in the EMR.
- Identification of the assessments required under each environmental factor
- Inclusion of all assessments.
- Details of specific mitigation measures and monitoring procedures that will be put in place for the development proposal for all three phases of the development process.
- Details of emergency responses in the event of failure of any proposed mitigation measure.

The following is a guide as to the type of assessment or plan that may be required under each environmental factor which should be included as part of the EMR. Other reports/assessments should also be included if relevant to the development proposal.

Environmental Factor	**Assessment/Plan**

Biodiversity, Flora and Fauna	• Ecological Assessment
Soils and Geology	• Peat Management and Disposal Plan (Appendix 4) • Geotechnical Assessment
Fresh Water Quality	• Surface Water Management Plan
Air, Climate, Energy	• Air, Climate and Energy Factors • Dust Minimisation (See Appendix 6)
Noise	• Guidance Notes (See Appendix 6)
Flooding	• Strategic Flood Risk Assessment for the Ireland West Airport Knock Planning Scheme • Guidance Notes (See Appendix 6)
Drinking Water/Wastewater	See
Waste Management	Construction and Demolition Waste Plan (See Appendix 6) Replacement Waste Management Plan for Connacht Region 2006-2011 Operational Waste Management Plan
Archaeology/ Architectural Heritage	Archaeological Assessment Architectural Options
Landscape	Landscape Plan

Ecological Assessment

Development proposals that include an ecological assessment as part of the EMR, shall generally be in accordance with the guidance set out below.

The assessment shall be carried out by suitably qualified persons and any surveys shall be conducted at the appropriate time of year.

Ecological Assessment

The Ecological Assessment should include the following details:

1. A detailed habitat map which shall include an overlay of the development proposal. Scale to be agreed with Planning Authority.

2. Written descriptions of all habitats within the receiving environment. Habitat mapping should be carried out in accordance with Heritage Council draft Guidelines for Survey of Habitats or equivalent standard. Habitats should be identified, described and mapped to level 3 of the Fossit[1] (2000) classification system. EU Habitats Directive[2] Annex I Habitats should also be referenced.

3. Key species of flora and fauna shall be identified, with particular emphasis on any rare, protected or annexed species by reference to the following:
    - Irish Red Data Books 1 (plants) and 2 (animals)[3]
    - Annex I of the EU Habitats Directive
    - Annex I of the EU Birds Directive[4]
    - Red or amber listed bird species in the current list of Birds of Conservation Concern in Ireland[5]

4. Reference to any previous studies and old ecological records for the site.

5. Evaluation of ecological significance of habitats and species occurring within the site;

6. Assessment of the likely impact of the proposed development both during construction and afterwards on habitats and rare or protected species within and adjacent to the site and a statement regarding the significance of these impacts.

Where appropriate, the report should include mitigation proposals. It should be shown that these are fully integrated into the design and layout and landscaping of the proposed development. The following should be provided:

a. Evidence of how mitigation will be secured and implemented and by whom;
b. Evidence of the degree of confidence in likely success of proposed mitigation;
c. Timescale, relative to the plan or project, for implementation of mitigation or completion;
d. Evidence as to how the measures will be monitored and, should mitigation failure be identified, how that failure will be rectified.

[1] Fossitt, J.A. (2000) *A Guide to Habitats in Ireland*. Heritage Council, Kilkenny.
[2] *Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora* (as amended)
[3] http://www.npws.ie/en/PublicationsLiterature/RedLists/
[4] ***Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds*** **(as amended)**
[5]http://www.birdwatchireland.ie/

Peat Management and Disposal Plan

Any development proposal that requires peat or vegetation removal shall be accompanied by a project specific Peat Management and Disposal Plan as part of the EMR. This shall be in accordance with the Guidance Peat Management and Disposal Plan outlined in Appendix 4 and the brief description set out below.

Peat Management and Disposal Plan

The plan should identify arrangements to be made for:

- the management of construction works to minimise the potential for peat slides
- means and locations for temporary storage of peat pending use in reinstatement works
- measures for the disposal of surplus peat
- measures for the restoration of any disused peat cuttings; and
- whenever necessary, confirmation that the required consents exist from owners, tenants and any relevant regulatory body for the proposed works.

The plan should also include measures for the removal of subsoil and bedrock

Geotechnical Assessment

Where development proposals involve the excavation of peat and soft soils on slopes, a geotechnical assessment of the potential risk of landslides should be included as part of the EMR.

Geotechnical Assessment

- the first stage of the assessment should consist of a desk top study and site visit undertaken by a suitably qualified person
- pending the findings, further ground investigation may be required to determine factors such as the steepness of slopes, moisture content of peat, depth of peat and the nature of the layer under the peat layer.
- where necessary, measures shall be incorporated into the development proposal by a geotechnical specialist to prevent landslides.

Surface Water Management Plan

A surface water management plan should be prepared for any proposed development within the Planning Scheme area, as part of the EMR. This should include measures to ensure that the development proposed alone or cumulatively with other proposals will not adversely affect the water quality of the area. The Surface Water Management Plan should focus on all stages of the development process, i.e. planning phase, the construction phase and the operational phase.

Surface Water Management Plan

The Surface Water Management Plan should include:

- details of Surface Water Systems which shall be designed in accordance with SUDS (Sustainable Urban Drainage Systems) and Surface Water Attenuation provided in order to restrict flows from development to Greenfield run off rates. Waste oils should not be disposed of in public or private sewer systems or discharged to watercourses. All surface water drainage systems should be fitted with petrol/oil interceptor traps.
- details relating to capacity predictions to ensure that the capacity of existing surface and ground waters are sufficient to accept new/increased discharges with no deterioration in current water body status
- details of drainage systems which should be designed to limit any potential of contamination from surface water runoff from reaching underlying soil and groundwater.
- other best practice techniques could incorporate the following measures:
    - to reduce runoff and sediment control
    - contamination prevention

Air, Climate and Energy Factors

The following factors should be considered in the design of all development proposals and should be included as part of the EMR.

Climate and Air Quality

All development proposals should include means to reduce the carbon footprint of the development scheme through innovate design and site layout solutions as well as implementing efficiency and renewable energy technologies. Development proposals should:

- combine energy efficiency measures with renewable energy technologies and resource consumption plans and examine features such as:
  - building fabric
  - heating
  - hot water controls
  - combined heat and power
  - ventilation and air conditioning
  - powering pumps and fans
  - lighting controls
  - office/catering equipment
  - transport requirements

Operational Waste Management Plan

The EMR should highlight any measures for the control and management of waste during the operational phase of any development proposal

Operational Waste Management Plan

Details should include measures to minimise waste production and maximise recycling and recovery through the introduction of sustainable waste management practices in all development proposals. Estimates should be indicated for each of the following categories of waste reduction:

- % of waste recycled Target 48% recycled
- % of energy recovery Target 33% energy recovery
- % to landfill Target 19% to landfill

and outline on-going measures/monitoring procedures to ascertain if the targets above can be achieved and/or improved.

Archaeological Assessment

Development proposals have the potential to impact on the archaeological heritage of sites identified in the Record of Monuments and Places, National Monuments, which are in the ownership or guardianship of the State are subject to Preservation Orders. Therefore, in order to safeguard the integrity of the archaeological sites in their setting in the landscape an archaeological assessment shall be submitted as part of the EMR for:

- planning applications that fall within the zones of archaeological potential as outlined on the Record of Monuments and Places
- all significant planning applications (i.e. development of lands on 0.5ha or more than 1km or more in length)

All archaeological assessments should be undertaken by a suitably qualified archaeologist and set out in accordance with the requirements of Mayo County Council and shall also have regard to natural heritage legislation.

Archaeological Assessment

The first part of the assessment should consist of a site visit and a desk top study undertaken by a suitably qualified archaeologist. Pending the findings of the assessment, one and/or more of the following may be required as part of any development proposal within the Plan area:

- geophysical and/or other invasive surveys (including architectural survey)
- licensed pre-development testing
- licensed archaeological excavation
- archaeological monitoring of ground works

A full underwater Archaeological Assessment (where appropriate) should also be completed.

The Archaeological Assessment should establish the extent of archaeological material associated with the archaeological site or monument and the potential impacts (if any) on the site or monument. The assessment should also define the buffer area or area contiguous with the archaeological site or monument which will preserve the setting and visual amenity of the site or monument.

The area of the archaeological site or monument and its buffer zone should not be included as part of the open space requirement demanded of a specific development but should be additional to the required open spaces.

Should an archaeological site or monument lie adjacent to or within the open space requirement for a development, a conservation plan for that archaeological site or monument should be required as part of the landscape plan for that development.

All archaeological sites and monuments included in the Record of Monuments and Places (RMP), any sites and features of historical and archaeological interest and any subsurface archaeological features that may be discovered during the course of infrastructural/development works should be preserved *in-situ* or by record.

Appendix 3: Peat Management and Disposal Plan Guidance Document

Peat Management and Disposal Plan Guidance Document

Peat Management and Disposal Plan Guidance Document

Introduction

During the construction phase of a project, an unavoidable impact will be the disturbance of underlying soils. In addition to the physical disturbance, fragmentation and fracturing of the soil by machinery employed for development, other impacts can be incurred such as the loss or destruction of the ecological and hydrological function of the soil and its inhabitants; both flora and fauna.

While some impacts on the soils of a potential construction site simply cannot be avoided, the main objective of this plan is to provide a framework for the restoration and management of the soils disturbed during the proposed construction stage (and decommissioning, whenever applicable) of the developments proposed under the Ireland West Airport Knock Strategic Environmental Assessment with specific regard to the ecological and hydrological elements of the soil in addition to the best practises for disposal of soil under all waste management legislation; local, national and European.

Along with the Strategic Environmental Assessment and Habitats Directive Assessment, this peat management and disposal plan guidance document has been prepared with advice by the National Parks and Wildlife Service from the viewpoint of the ecological and environmental consequences of peat disturbance and / or removal during any development of any areas within the plan area. Lands developed in a peat-dominated catchment may be liable to flooding / pooling and landslides are also considered a potential concern.

The Strategic Development Zone Planning Scheme for the Ireland West Airport Knock, a large proportion of the land within the LAP area boundary has been identified as peat; specifically, upland blanket bog (PB2) and cutover bog (PB4). This peat, of varying depths, has already witnessed intervention with a proportion of it previously drained and reclaimed for agricultural purposes. An additional habitat of wet grassland within the confines of the airport site has been observed; present as a successive habitat following the removal of excavated peat in the past.

Characteristics of peat

Peat is defined as a soil derived from the partial organic decomposition of organic material; animal and plant remain. It is generally light to dark brown in colour and is high in water content; generally, a waterlogged and anaerobic medium. Peat-producing ecosystems include bog and fen, with bog differing from fen in that water is not supplied from groundwater but rather from atmospheric precipitation. In addition, conditions tend to be acidic (< 5.5).

In Ireland, peatland is categorised as raised or blanket bog, with fen as the supporting medium for raised bog once the mineral-rich water supply has been cut off. Blanket and raised bog vary in their general characteristics; formation, peat depth, location and floral and faunal inhabitants. Generally, raised bog is formed on lake basins, has a general depth of up to 12m, is located mainly in the midlands with fragmented outcrops throughout the country and is generally more acidic than blanket bog. With

shallower depths, slightly more basic conditions and formed on mineral soils, blanket bog is more common in smaller outcrops and classified as mountain and lowland. *Sphagnum* species and mosses, bog cotton (*Eriophorum vaginatum*) and sundews (*Drosera* spp.) are common to both raised and blanket bogs, while marsh saxifrage (*Saxifraga hirculus L.*) and slender cotton grass (*Eriophorum gracile Koch ex Roth*) are associated with blanket bog. Common invertebrates inhabiting both bog types include odonatids (damselflies and dragonflies) and tipulids; other animals include *Rana temporaria* and *Lepus timidus hibernicus*.

Peat soil is classified into two separate layers known as acrotelm layer and the catotelm layer; the former being the upper and the latter the lower or deeper layer. The acrotelm layer is characterised by its fibrous nature as it contains plant roots. It is somewhat tensile and is dry in contrast to the catotelm layer. Generally very wet with a tendency to break apart upon disturbance, peat in the catotelm layer has little use due to its structure and low tensile strength.

Ireland West Airport Knock Plan Area – impacts of peat excavation

In considering the disturbance and removal of soil from within the area of the plan, three issues should be considered; ecological function of the peat land, potential release of peat-bound carbon and the proper restoration and recovery (or disposal) of the peat.

Ecological consequences

While the blanket bog within the plan area has not been afforded protection by a designation under the Habitats Directive, some individual plots examined have been identified as priority habitats, specifically active raised bog [7110]. Disturbance to these habitats should be minimal but when disturbance is unavoidable, restoration of the habitat and its ecological function is an important factor.

Carbon release

Peat lands are recognised carbon sinks and a significant proportion of all soil carbon is bound to peat soils. In fact, peat soils can store, on average, 10 times more carbon dioxide (CO_2), the leading greenhouse gas, than other ecosystems. Hence, excavation of peat soils will give rise to the release of carbon to the atmosphere, a very important consideration in terms of the climate change monitoring. The volume of peat soil-stored carbon within the area of the plan may be quantified using three parameters; bulk density of peat, organic carbon concentration and peat depth.

Peat restoration and waste peat disposal

With the marked increases in wastes arising from construction and demolition projects in Ireland during the early to middle part of the last decade, regional and national waste management plans illustrated unprecedented volumes of construction and demolition (C&D) wastes to be reused, recycled or recovered (disposal of C&D waste is generally not a preferred option and contaminated C&D waste can be de-contaminated and recovered for fill material).

Improper management of C&D waste leads to further problems; cost considerations and environmental consequences.

Peat management and restoration

The primary aim of restoring the original peatland is to avoid the loss of soil carbon and to create the conditions for peat accumulation and restoration, mainly by the re-colonisation of *Sphagnum* mosses. Since avoidance of peat may not be an option within the area of the plan it is vital, whenever appropriate, to maintain local hydrological conditions necessary for peat formation, maintenance and regeneration. Prevention of peat compression by heavy machinery will ensure that water movement is not prevented; if not, pooling may occur, leading to desiccation of other portions of the peat land. When traversing peatland, its stability is very important from a health and safety viewpoint in addition to peat displacement issues and consequent release of carbon.

Any excavated peat and its vegetation removed during or pre- construction phase should be stored in contained bunds. Following the construction period, any exposed soil should be covered with the excavated peat (and vegetation) to encourage re-colonisation of vegetation. This return process should be 'first-removed-in-first in reverse order to its removal' in order for roots to re-establish in as natural a progression as possible. In some construction projects, excavation and replacement can be conducted simultaneously.

Storage of excavated peat with its vegetation should be for as short a time as possible and the peat-contained bunds should never be located on areas of intact vegetation; this would result in further unnecessary deterioration of additional peat and the loss or disturbance of the ecological and hydrological function of the soil. Further, during cut operations, perched interstitial surface water within the peat deposits will probably be encountered. The shallow groundwater that seeps out at the peat cuttings should be properly contained, channelled and directed to the down gradient side of the cutting.

Water and run-off control and interceptor drainage works, including silt traps and/or retention ponds should be installed prior to diverting existing drainage channels to inhibit the mobilisation of contaminants into the bedrock or surface water systems. This is vital to prevent increases in soil-laden runoff which may introduce unwanted suspended solids and peat-bound nutrients to waters; phosphorus is the principal element associated with the eutrophication of surface waters while increased suspended solids have proven detrimental to salmon (*Salmo salar*) smolts, *Austropotamobius pallipes* and *Margaritifera*.

Finally, it should be noted that restoration of a peatland can take from five to thirty years depending on the initial condition and primarily the effectiveness of raising the water table to or near to the surface. Long-term monitoring is essential to develop cost-effective techniques and methods that work to ensure successful restoration, including surveys to identify *Sphagnum* spp. re-colonisation.

Land uses such as grazing may need examination and if deemed necessary may be prevented to allow the successful re-colonisation of the peat flora.

Peat Disposal

Since acceptable uses of excavated peat are finite, there will be, inevitably, surplus peat material which will require disposal. Disposal of this waste peat should occur off-site at an authorised waste facility; whether an EPA-licensed or a local authority-permitted facility will be dependent on the volume of waste. (Should chemical analyses of soil indicate the presence of contaminants, the waste facility chosen should be authorised to accept hazardous waste soil – European Waste Catalogue (EWC) code 17 05 03*.)

Generally, contaminated soils are treated off-site to make them non-hazardous and are subsequently disposed of as a non-hazardous substance. All procedures followed in the disposal of peat soils, contaminated or otherwise, should follow best practice guidelines and meet the requirements of the Waste Management Acts, 1996 to 2011 in addition to the objectives of the most current Waste Management Plan for the Connaught Region (and other relevant waste management plans which may apply). Such objectives will be detailed in the waste management plan for all relevant phases of construction, including, in addition to an authorised waste facility, the person / company hauling the waste peat must be in possession of a current waste collection permit, which authorises the movement of waste from site to an authorised facility in an approved vehicle; all details should be in Appendices A, B and C of the current permit.

Peat Management and Disposal Plan - Conclusion

The Peat Management and Disposal Plan guidance document has been prepared and designed to minimise any actual loss of peat, to ensure rapid restoration of the vegetation post-construction and to ensure the proper recovery of water peat. It has set objectives and introduced guidelines for the prevention of the unnecessary loss of the peat habitat and the disturbance of inhabiting species. In addition, loss of peat-bound carbon to the atmosphere will be minimised by the meticulous pre-construction planning of peat recovery and restoration. The management of waste peat will be conducted using best practice guidelines and in conjunction with the most recent and updated waste management legislation, both national and regional.

The Peat Management Plan will underpin the LAP for the Ireland West Airport Knock, to ensure that best practice measures are implemented at the outset. It will also be used as a guidance document during the application for the designation of the LAP area as a Strategic Development Zone.

The plan should identify arrangements to be made for;

3) the management of construction works to minimise the potential for peat slides;
4) means and locations for temporary storage of peat pending use in reinstatement works;
5) measures for the disposal of surplus peat;
6) measures for the restoration of any disused peat cuttings; and

7) whenever necessary, confirmation that the required consents exist from owners, tenants and any relevant regulatory body for the proposed works.

Peat Management and Disposal Plan – a summary

Requirement	Check	Action
Avoid areas of peat whenever necessary	Ensure that other environmental constraints are not encountered when avoiding peat	Identify all areas of peat Investigate peat slide / landslide / bog burst risk areas
Maintain local hydrological conditions necessary for peat formation, maintenance and regeneration	Identify sensitivities of adjacent habitats Identify peat type (raised and blanket bog are maintained by different hydrological regime) Check for variation in peat character	Be familiar with cSAC location and habitat and species sensitivities Include mitigation measures for maintenance of peatland hydrology Site restoration should be considered at early stage of development
Ensure vehicles do not compress peat, creating barriers to water movement (leads to pooling and desiccation)	Check vulnerability of peat habitat to changes in water content	Design site to avoid interruption of water flow Design site to spread load over as wide an area as possible in land made available Be familiar with cSAC location and habitat and species sensitivities Consider the potential for peat slump
Consider stability issues	Check gradients in field	Avoid steep slopes Avoid saturated peatlands whenever possible Use reinforcement techniques whenever necessary
Store excavated peat carefully	Ensure that bunds for this purpose are suitable and adequate for volume of peat	Storage of peat should be for as short a period as possible Storage should not occur on located on areas of intact vegetation
Prevent the release of runoff and drainage waters to the aquatic and terrestrial environment	Identify the risks for pollution from seepage from groundwater and runoff	Ensure that water and runoff control and interceptor drainage works, including silt traps and/or retention ponds are installed prior to diverting existing drainage channels to inhibit the mobilisation of contaminants into

		the bedrock or surface water system
Restore borrow areas strategically	Ensure that the aim of re-colonisation of *Sphagnum* spp. and other peat-inhabiting flora is encouraged insofar as possible	Peat (and its flora) should be returned in a 'first-removed-in-first' in reverse order to its removal in order for roots to re-establish in as natural a progression as possible
Recover waste peat using best practice guidelines	Identify risks for pollution of both terrestrial and aquatic environments by removal and movement of waste peat	If deemed necessary, peat samples should be chemically analysed to determine contamination Ensure recovery of waste is to an authorised facility (EPA-licensed or local authority-permitted) and hauled by an authorised waste collection permit holder (movement of EWC 17 05 04 or 17 05 03*)

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Appendix 4: Plans, Polices and Programmes Reviewed

Plans, Polices and Programmes Reviewed

International Plans, Policies and Programmes

Title	Summary
Environmental Assessment	
SEA Directive - Assessment of the effects of certain plans and programmes on the Environment, (2001/42/EC) 2001	This Directive requires plan-makers to carry out an assessment of the likely significant environmental effects of implementing a plan or programme before the plan or programme is adopted.
Environmental Impact Assessment Directive (85/337/EEC).	The EIA Directive (85/337/EEC) was adopted in 1985 and employs to wide range of defined public and private projects, which are defined in Annexes I and II of the Directive. It was amended with Directive 2011/92/EU and the 2014 Directive (see below).
Environmental Impact Assessment Directive (2014/52/EC)	It is necessary to amend Directive 2011/92/EU in order to strengthen the quality of the environmental impact assessment procedure, align that procedure with the principles of smart regulation and enhance coherence and synergies with other Union legislation and policies, as well as strategies and policies developed by Member States in areas of national competence. The Directive will apply for all EIS from 2017 but should be considered when preparing EIS currently.
Biodiversity, Flora and Fauna	
UN Convention of Biological Diversity, 1992	The Convention on Biological Diversity (CBD) was enacted in December 1993 and has 3 main objectives: The conservation of biological diversity, the sustainable use of the components of biological diversity and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources.
The Convention on Wetlands of International Importance (The Ramsar Convention) 1971 and subsequent amendments	Protection and conservation of wetlands and habitats of importance to waterfowl.
EU Biodiversity Strategy to 2020	In 2011 the European Commission adopted a new policy to stop the loss of biodiversity and ecosystem services in the EU by 2020. There are six main targets, and 20 actions to help Europe reach its goal. The six targets cover: Full implementation of EU nature legislation to protect biodiversity, better protection for ecosystems, and more use of green infrastructure, more sustainable agriculture and forestry, better management of fish stocks, tighter controls on invasive alien species. A bigger EU contribution to averting global biodiversity loss.
EU Directive on the Conservation of Wild Birds, (2009/147/EC) 1979.	This is also known as Birds Directive, it ensures far-reaching protection for all of Europe's wild birds, identifying 194 species and sub-species among them as particularly threatened and in need of special conservation measures. Member States are required to designate Special Protection Areas (SPAs) for 194 particularly threatened species and all migratory bird species. SPAs are scientifically identified areas critical for the survival of the targeted species, such as wetlands. They are part of the Natura 2000 ecological network established under the Habitats Directive 92/43/EEC.
EU Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna, (92/43/EEC), 1992 known as the Habitats Directive	This directive aims to promote the maintenance of biodiversity by requiring Member States to take measures to maintain, restore or protect natural habitats, animal and plant species to a favourable conservation status, by introducing robust protection for habitats and species that are of European importance. For Ireland, these habitats include raised bogs, active blanket bogs, turloughs, sand dunes, machair (flat sandy plains on the north and west coasts), heaths, lakes, rivers, woodlands, estuaries and sea inlets. The Directive provides for a network of protected sites known as The Natura 2000 network, which limits the extent and nature of development which may have a detrimental effect on the flora or fauna identified therein.

European Communities (Birds and Natural Habitats) Regulations 2011	The European Communities (Natural Habitats) Regulations 1997 to 2005 and the European Communities (Birds and Natural Habitats) (Control of Recreational Activities) Regulations 2010 address transposition failures identified in the CJEU judgements. Articles 6(1) and (2) of the Regulations require Member States to take appropriate conservation measures to maintain and restore habitats and species, for which a site has been designated, to a favourable conservation status. Furthermore, the Regulations require Member States to avoid damaging activities that could significantly disturb these species or deteriorate the habitats of the protected species or habitat types. Under these regulations any plan or project likely to have a significant effect on a Natura 2000 site, either individually or in combination with other plans or projects, shall undergo an Appropriate Assessment to determine its implications for the site. The competent authorities can only agree to the plan or project after having ascertained that it will not adversely affect the integrity of the site concerned. In exceptional circumstances, a plan or project may still be allowed to go ahead, in spite of a negative assessment, provided there are no alternative solutions and the plan or project is considered to be of overriding public interest.
Green Infrastructure Strategy 2013	The Green Infrastructure Strategy was adopted by The European Commission in May 2013, 'to promote the deployment of green infrastructure in the EU in urban and rural areas'. This is an essential stage in implementing the EU 2020 Biodiversity Strategy and specifically Target 2 requires that 'by 2020, ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15% of degraded ecosystems'. Green Infrastructure (GI) is contributing to all other targets of the EU Biodiversity strategy.
Soils and Geology	
EU Soil Thematic Strategy	The European Commission published the final Thematic Strategy for Soil Protection (COM (2006)231 final) in September 2006 and a proposal for a Directive establishing a framework for the protection of soil across the EU (COM (2006) 232). The objective of the strategy is to protect and ensure the sustainable use of soil, based on the guiding principles of preserving soil functions, preventing further degradation and restoring degraded soils to a level of functionality consistent with current and intended use. Once adopted the European Soil Thematic Strategy will guide and frame Ireland's approach to developing its own soil protection strategy.
Water	
Water Framework Directive (2000/60/EC) as amended	The Water Framework Directive (WFD) was adopted in 2000 in an effort to establish a framework for the protection of waterbodies within the EU including: inland surface waters; groundwater; transitional waters; and coastal waters. The key aims of the WFD are: • expanding the scope of water protection to all waters, surface waters and groundwater; • achieving "good status" for all waters by a set deadline • water management based on river basins; • "combined approach" of emission limit values and quality standards. · getting the prices right; • getting the citizen involved more closely, and • streamlining legislation. Its ultimate objective is to achieve "good ecological and chemical status" for all Community waters by 2015.
The Drinking Water Directive (DWD), (98/83/EC) 1998	This Directive is intended to protect human health by laying down healthiness and purity requirements which must be met by drinking water within the Community.
Sustainable Development	
EU Environmental Action Programme to 2020	The 7th EU Environmental Action Programme is more strategic in nature and identifies three main areas to guide EU environmental policy and research. The three thematic priority objectives are intended to:

	• Protect nature and strengthen ecological resilience • Boost sustainable resource-efficient low-carbon growth, and • Effectively address environment-related threats to health.
Material Assets	
EU Directive on Waste, (2006/12/EC), 2006	This Directive requires EU States to publish waste management plans. It requires a system of permits and registrations to be put in place to authorise all waste management infrastructure, as well as setting down the basic requirements that need to be satisfied for these statutory authorisations to be issued.
EU Directive on Waste (2008/98/EC), 2008	This Directive establishes a legal framework for the treatment of waste within the Community. It aims at protecting the environment and human health through the prevention of the harmful effects of waste generation and waste management. The Directive requires Member States to take measures for the treatment of their waste in line with the following hierarchy which is listed in order of priority: prevention; preparing for reuse; recycling; other recovery, notably energy recovery; disposal.
EU Urban Waste Water Treatment Directive (91/271/EEC), 1991	The aim of the Urban Waste Water Directive is to protect inland surface waters from the adverse effects of discharges of urban wastewater and discharge of certain biodegradable industrial waste water (particularly from the agri-food industry)
Directive 2009/28/EC on the promotion of the use of energy from renewable sources	Directive 2009/28/EC on the promotion of the use of energy from renewable sources establishes the basis for the achievement of the EU's 20% renewable energy target by 2020. Under the terms of the Directive, each Member State is set an individually binding renewable energy target, which will contribute to the achievement of the overall EU goal. Each Member State is required to adopt a national renewable energy action plan.

National Plans, Policies and Programmes

Title	Summary
Sustainable Development	
National Planning Framework	The new framework document will be the successor to the National Spatial Strategy 2002 (NSS) and will be known as the National Planning Framework (NPF). The National Planning Framework will be the long-term, 20 year strategy for the spatial development of Ireland that will promote a better quality of life for all, with sustainable economic growth and an environment of the highest quality as key underlying principles.
Capital Investment Plan 2016- 2021 (DPER, 2015)	On 29 September 2015 the Government announced its capital spending plan which is a high level budgetary and finance document worth an estimated €27 billion in direct investment by the Exchequer over 6 years. This amounts to an average of €4.5 billion per year and is expected to create in the region of 45,000 jobs during the construction phase. Following public consultation, a review of the plan is expected to be published in 2017 and a new ten year plan to be published before end of 2017.
Biodiversity, Flora and Fauna	
National Biodiversity Action Plan 2017-2021	In response to the requirements set out in Article 6 of the UN Convention of Biological Diversity 1992, the first Biodiversity Action Plan (BAP) was prepared by the Department of Arts, Heritage and the Gaeltacht, subsequently revised in 2011. The aims are to achieve Ireland's Vision for Biodiversity through addressing issues ranging from improving the management of protected areas to increasing awareness and appreciation of biodiversity and ecosystem services. Ireland's third iteration of the BAP for conserving and restoring Ireland's biodiversity covers the period 2017 to 2021.

Smarter Transport / Strategic Framework for Integrated Land Transport (DTTAS)	Smarter Travel is the transport policy for Ireland that sets out how the vision of a sustainable travel and transport system can be achieved.
River Basin Management Plan 2018-2021	The Government has published the River Basin Management Plan for Ireland 2018-2021. The Plan sets out the actions that Ireland will take to improve water quality and achieve 'good' ecological status in water bodies (rivers, lakes, estuaries and coastal waters) by 2027. Ireland is required to produce a river basin management plan under the Water Framework Directive (WFD). Water quality in Ireland has deteriorated over the past two decades. The Plan provides a more coordinated framework for improving the quality of our waters — to protect public health, the environment, water amenities and to sustain water-intensive industries, including agri-food and tourism, particularly in rural Ireland.
NPWS Conservation Plans for SACs and SPAs and NHAs	The NPWS produces a draft conservation plan for each SAC, SPA and NHA. Each plan lists the wildlife resources of the area, the current human uses, any conflicts between the two, and strategies for retaining the conservation value. These documents are made available on the NPWS website and to interested parties for a consultation period, following which the final version of the conservation plan is completed. It is intended that plans will be reviewed every 5 years. It is expected that these plans will be consulted/referenced during the preparation of farm management plans for holdings within and nearby the nature conservation site.
National Peatland Strategy (DAHG, 2015) and National Peatlands Strategy Progress Report 2017 (DCHG, 2018)	In April 2011 the Government made a number of key decisions relating to the conservation and management of Ireland's peatlands, particularly those sites nominated for designation as Special Areas of Conservation and Natural Heritage Areas. A commitment was made to draw up a national strategy on peatlands conservation and management, in consultation with bog owners and other stakeholders, to deal with long-term issues such as land management & development, restoration, conservation, tourism potential, carbon accounting and community participation in managing this resource. In order to ensure that actions are implemented, the Peatlands Strategy Implementation Group (PSIG) was established, which comprises a cross-departmental group to monitor the strategy's implementation. The group published its progress report in August 2018.
Climate and Air Quality	
National Climate Change Strategy (20017-2012)	The National Climate Change Strategy 2007 - 2012 sets out a range of measures, building on those already in place under the first National Climate Change Strategy (2000) to ensure Ireland reaches its target under the Kyoto Protocol. The Strategy provides a framework for action to reduce Ireland's greenhouse gas emissions.
Climate Action ad Low Carbon Act	The act provides for the making of: • five-yearly National Mitigation Plans to specify the policy measures to reduce greenhouse gas emissions • a National Adaptation Framework to specify the national strategy for the application of adaptation measures in different sectors and by local authorities to reduce the vulnerability of the State to the negative effects of climate change. The Act also establishes the Climate Change Advisory Council to advise ministers and the government on climate change matters.
The National Mitigation Plan	The National Mitigation Plan, the primary objective of which will be to track implementation of measures already underway and identify additional measures in the longer term to reduce greenhouse gas emissions and progress the overall national low carbon transition agenda to 2050. The first iteration will focus on measures up to 2020 and thereafter to 2015. The Plan will incorporate sectoral mitigation measures to reduce greenhouse gases, to be adopted by relevant Ministers with responsibility for key sectors, including agriculture, transport, energy and the built environment

National Climate Change Adaption Framework (2012)	Ireland's first National Climate Change Adaptation Framework (NCCAF), which was published in December 2012, aims to ensure that adaptation actions are taken across key sectors and also at local level to reduce Ireland's vulnerability to climate change
Ireland's Green House Gas Emissions Projections for 2017-2035	This was published as a good practice guidance note on how to incorporate climate change into plans and programmes falling under the remit of the SEA Directive Key aspects to be considered in the Plan and SEA, where relevant, include: - Direct and indirect impacts of the Plan on greenhouse gas emissions and removals (Mitigation) - Direct and indirect impacts of climate change on the implementation of the Plan, e.g. the resilience of critical water service infrastructure to flooding and drought (Adaptation) - The linkages between mitigation and adaptation (inter-relationships)
Irish Water Services Strategic Plan SEA and AA 2015	The Water Services Strategic Plan (WSSP) sets out the strategies to implement as a country in the short, medium and longer term to ensure the availability of safe drinking water, an environment that is protected from the impacts of wastewater discharges, and efficient modern systems that meet the needs of customers, contribute to economic growth and development, and provide value for money. The document addresses six key themes of customer service, clean safe drinking water, effective treatment of wastewater, a sustainable environment, supporting economic growth and investing for the future. The plan was subject to SEA and AA.
Irish Water Capital Investment Programme 2014	Irish Water priorities for delivery under the Capital Investment Plan include; 1. Eliminating Boil Water Notices in Roscommon 2. Providing more water and in particular reducing disruption to supply in the Dublin area 3. Improving Water Quality 4. Investing for economic development 5. Tackling leakage 6. Increasing wastewater treatment capacity and improving environmental compliance 7. Better Control and Monitoring 8. Improving existing plants Associated with this is the proposed upgrade to the Ringsend WTTP that has been subject to EIS and NIS and aims to be submitted to An Bord Pleanála end 2016.
Cultural Heritage Archaeology and Built Heritage	
National Monuments Act 1930 with subsequent amendments	This is the primary legal protection to archaeology in Ireland and has been amended a number of times, most recently 2004.
Architectural Heritage Protection - Guidelines for Planning Authorities (2011)	The 2004 guidelines were reissued in 2011 following the transfer of architectural heritage protection functions to the Department of Arts, Heritage and the Gaeltacht. Part IV of the Planning and Development Acts 2000 – 2015 sets out the legislative provisions for the protection and conservation of our architectural heritage.
Landscape	
A National Landscape Strategy for Ireland 2015	The Department of Arts, Heritage and the Gaeltacht has issued a National Landscape Strategy for Ireland which sets out objectives and principles in the context of a proposed National Landscape Strategy for Ireland.
Draft Landscape and Landscape Assessment Guidelines, (2000)	These Guidelines attempt to approach landscape appraisal in a systematic manner and recommend Landscape Character Assessment (LCA) as the method for assessment. LCA involves the characterisation of landscape based primarily on landcover (trees, vegetation, water etc.) and secondly on the value (i.e. historical, cultural, etc.). LCA is intended to aid the development management process as it gives indicators of development types which would be suited to certain locations using certain design criteria and consequently the character of the landscape remains intact.

Regional and County Plans, Policies and Programmes

Title	Summary
Sustainable Development	
Draft Regional Spatial and Economic Strategy	Regional Spatial and Economic Strategies (RSES) are intended to replace the current Regional Planning Guidelines. The RSESs are expected to cover the period 2016-2022. Regional structures and functions are currently being revised and strengthened; the existing eight regional authorities and two assemblies are being replaced by three new Regional Assemblies to perform an updated range of strategic functions. In addition to formulating RSESs, the main functions of the new Regional Assemblies will also include strategic functions under relevant legislation, functions that relate to EU funding programmes as well as oversight of local authority performance and the implementation of national policy.
River Basin Management Plan (RBMP)	A key development in meeting the requirements of the Water Framework Directive has been the publication of River Basin Management Plans. The plans implement the objectives of the Water Framework Directive. The aim is to achieve good water quality status in all waterbodies by 2015, through the implementation of a programme of Measures (POM). The Minister for the Environment, Community and Local Government has put in place new governance structures and administrative arrangements for the implementation of a second cycle of River Basin Management Plans and this will change the context for future reporting on water quality in Ireland. The existing seven River Basin Districts are to be reconfigured into three RBDs. The second cycle of RBM plans cover the period 2017-2021.
Mayo County Development Plan 2014-2020	The County Development Plan is a spatial planning framework that gives effect to the delivery of sustainable and planned economic and social development in a manner consistent with higher levels plans and strategies such as the National Spatial Strategy and the Regional Planning Guidelines for the West Region. The plan is reviewed every 6 years. It is currently stalled awaiting the publication of the RSES regional guidelines.
Water Services Strategic Plan	The Water Services Act 2014 provides that the water services authority makes a Water Services Strategic Plan (WSSP) with regard to the provision of water services. As such, Irish Water, as the national water service utility for Ireland, has developed a Water Services Strategic Plan for the next 25 years. The priorities for Irish Water under the WSSP are the delivery of improved and affordable water services, remediation of existing water quality problems (e.g. boil notices), complying with the Urban Wastewater Treatment Directive, reduction of leaks in the water system and the capture of water infrastructure information in databases. The WSSP's objectives also have regard to flood risk management.
Groundwater Protection Schemes	Groundwater protection schemes are undertaken jointly between the Geological Survey of Ireland and the local authorities. The objectives of such schemes are to preserve groundwater quality, in particular having regard to extraction for drinking water purposes. The schemes do not have any statutory authority but do set out a framework to help inform decision-making and provide guidelines for the local authorities in carrying out their functions. The Plan should have regard to any such groundwater protection schemes.
Water and Wastewater	
Catchment Flood Risk and Management Studies (CFRAMS)	The Office of Public Works (OPW) is responsible for the implementation of the Floods Directive 2007/60/EC which is being carried out through a Catchment-based Flood Risk Assessment and Management (CFRAM) Programme. As part of the directive Ireland is required to undertake a Preliminary Flood Risk Assessment (PFRA), to identify areas of existing or potentially significant future flood risk and to prepare flood hazard and risk maps for these areas. Following this, Flood Risk Management Plans (FRMPs) are developed for these areas setting objectives for managing the flood risk and setting

	out a prioritised set of measures to achieve the objectives. The CFRAM programme is currently being rolled out and Draft FRMPs have been prepared.
River Basin Management Plan (RBMP)	A key development in meeting the requirements of the Water Framework Directive has been the publication of River Basin Management Plans. The plans implement the objectives of the Water Framework Directive. The aim is to achieve good water quality status in all waterbodies by 2015, through the implementation of a programme of Measures (POM). The Minister for the Environment, Community and Local Government has put in place new governance structures and administrative arrangements for the implementation of a second cycle of River Basin Management Plans and this will change the context for future reporting on water quality in Ireland. The existing seven River Basin Districts are to be reconfigured into three RBDs. The second cycle of RBM plans cover the period 2017-2021.

Appendix 5: Evaluation of Planning Scheme

Evaluation of Planning Scheme

The assessment of the likely significant effects on the environment of implementing the Planning Scheme for the SDZ was carried out, in accordance with best practice methodology. The methodology employed was the accepted and commonly used methodology of creating a matrix, whereby the policies and objectives of

Table 23 Principles for Land Use and Development

Principles of draft Ireland West Airport Knock SDZ Planning Scheme	BFF	PHH	SG	W	AQN	C	MA	L
Overarching Principle To direct development and appropriate land-uses across the SDZ lands in a manner that creates a sustainable economic business district that is based on the integration of land-use, transport and aviation considerations.	√	√√	√√	√√	√√	√	√	√√
Key Principles To coordinate aviation, commercial and employment uses that maximizes the best use of the existing airport location and its future expansion;	√	√√	0	0	√√	√	√√	√
To promote appropriate commercial development and the required infrastructure to support the expansion of the aviation and related sectors at IWAK.	0	√√	√	0	X	0	√	√
To incorporate business and enterprise development at IWAK in a sensitive and appropriate manner having regard to the operations of the airport and to the unique rural setting, its topography and surrounding landscape;	√√	√	√√	0	X	√	√	√
To establish four distinct economically focused development areas that function independently and collectively compliment each other — airport/passenger terminal and associated operational area; MRO campus; hotel and conference campus; business & innovation hub;	√	√√	0	0	√	0	√	√
To support the development of a sustainable business and commercial district and to ensure that new development is carried out in accordance with Government Policy.	√√	√√	0	0	√	√	√√	√

Table 24 Principles for Movement and Transport

Principles of draft Ireland West Airport Knock SDZ Planning Scheme	**BFF**	**PHH**	**SG**	**W**	**AQN**	**C**	**MA**	**L**
Overarching Principle To develop the SDZ lands in a manner that supports a range of sustainable modes of transport to, from and within the lands at IWAK and to maximise existing and potential public transport opportunities, mainly bus services and support such opportunities with an integrated network of roads and routes with a clear hierarchy that promotes walking and cycling.	√	√√	0	0	X	√√	√	√
Key Principles To develop a roads network hierarchy within the Planning Scheme that facilitates access and movement appropriate to needs.	X	√√	0	0	X	√	√√	√
To link the Development Areas within the IWAK SDZ lands with each other in a clear hierarchy of roads and dedicated pedestrian and cycle routes.	√	√√	√	0	0	√√	√	√
To develop a transport framework that facilitates a range of transport options and appropriate access within the Planning Scheme area by means of walking, cycling and public transport.	√√	√√	0	0	√	√√	√	√√
To make adequate provision for car and bicycle parking.	X	√	0	0	X	√√	√	0

Table 25 Principles for Green Infrastructure, Biodiversity and Natural Heritage

Principles of draft Ireland West Airport Knock SDZ Planning Scheme	BFF	PHH	SG	W	AQN	C	MA	L
Overarching Principle To deliver a network of green infrastructure and spaces throughout the Planning Scheme while protecting, enhancing and sensitively accommodating the natural assets of the lands and surrounding countryside.	√√	√√	√	√	√	√√	√	√
Key Principles To protect, enhance and develop an interconnected green infrastructure network incorporating hedgerows, streams and open space for amenity and wellbeing, protection of biodiversity, flood management and adaption for climate change.	√√	√√	√	√√	0	√√	√	√
To incorporate the use of appropriate new green infrastructure such as planting, natural open spaces and sustainable urban drainage systems.	√√	√	√	√√	√√	√√	√	√√
To seek to protect and enhance natural, built and cultural heritage features such as hedgerows, stone walls, bridges and river corridors to support native plant and animal species.	√√	√	√	√√	√	√√	√	√
To connect areas of open space with ecological and recreational corridors to aid the movement of biodiversity and people and to strengthen the overall green infrastructure network.	√√	√√	√	?	√	√√	√√	√
Incorporate biodiversity and natural heritage into new developments.	√√	√	√√	√	√	√√	√	√
To require the use of native planting, shrubs and grasses in landscape proposals and promote the re-use of existing topsoil and subsoils within landscaping plans for open space areas to allow the preservation of the native seed bank within landscaping schemes.	√√	0	√√	√	√√	√√	√	√√

To require all proposals for open space and landscape design to include biodiversity conservation and enhancement measures.	√√	√	√	√	√	√	√	√

Table 26 Principles for Economics Section

Principles of draft Ireland West Airport Knock SDZ Planning Scheme	**BFF**	**PHH**	**SG**	**W**	**AQN**	**C**	**MA**	**L**
Overarching Principle To promote the development of the SDZ lands at IWAK as a new dynamic location for economic investment for tourism, travel, business and enterprise.	0	√√	√	√√	√√	√√	√√	√
Key Principles To provide for the expansion of IWAK and its associated activities as a travel and tourism hub for the West and North West Region;	0	√√	0	√	X	√	√	0
To provide the development of the Maintenance Repair Overhaul (MRO) sector at IWAK;	0	√	0	0	0	0	0	0
To provide for a range of business and employment accommodation types compatible with the airport location;	0	√√	0	√	√√	√	√√	√
To create a new regional scale business and innovation destination that will generate employment and enterprise and act as a regional economic driver;	0	√√	0	√	√	√√	√√	0

To create a unique identity and sense of place as a desired business location for key market and employment sectors;	0	√√	0	0	0	0	0	0
To support and facilitate the provision of additional strategic infrastructure to enhance the attractiveness of the SDZ lands as a location for economic development;	√	√√	√	√	√	√	√	0
To provide an appropriate and sustainable provision of development that is demand-led.	0	√√	√	√	0	√√	√	√
Identify and attract appropriate tenants and investors to IWAK SDZ, whilst not competing with employment locations within the regional catchment.	0	√√	0	√	√	0	√√	√
To support and facilitate the provision of additional key infrastructure to enhance the attractiveness of the SDZ lands as a location for economic development.	0	√√	√	√	0	√	√	0

Table 27 Principles for Built Form and Design

Principles of draft Ireland West Airport Knock SDZ Planning Scheme	**BFF**	**PHH**	**SG**	**W**	**AQN**	**C**	**MA**	**L**
Key Principles To ensure that development is in accordance with best practice that adheres to its primary function while promoting identity between development areas;	√	√	0	0	√	0	√	√

To ensure that development is laid out in a series of coherent development areas facilitated by plots that are functional, legible, with appropriate topography responses, building heights and landscaping.	√√	√	√√	0	√	√	√√	√√
To design a roads network appropriate to the area, incorporating provisions for pedestrian, cyclist and vehicular movement.	X	√√	√	0	√	√√	√	√

Table 28 Principles for Sustainability

Principles of draft Ireland West Airport Knock SDZ Planning Scheme	**BFF**	**PHH**	**SG**	**W**	**AQN**	**C**	**MA**	**L**
Overarching Principle To create a quality built environment that is sensitive to the setting. IWAK SDZ will provide green infrastructure, sustainable urban drainage (SUDs) and energy and climate change mitigation measures to support the 'green economy'.	√√	√	√	√√	√	√√	√	√
Key Principles To promote the use of green and renewable building materials and technologies in all new developments throughout the SDZ area.	√√	0	0	√	√√	√√	√	√√
To facilitate and encouraging the use of sustainable modes of transport.	√√	√√	0	0	√√	√√	√	√√
Promoting and supporting improvements in the public realm which reduces energy consumption, support SuDS, increase carbon sequestering.	√√	√√	√	√√	√√	√√	√	√√
To support and promote the development of a major renewable energy installation (USSPV solar farm) which will provide a significant renewable energy source to the airport.	√	0	0	0	√√	√√	√	√

To promote measures that encourage conservation of water, reuse and protection.	√√	√√	√	√√	√√	√√	√	√

BFF Biodiversity, Flora and Fauna

SG Soils and Geology

W Water

AQN Air Quality and Noise

MA Material Assets

L Landscape

Appendix 6: Guidance Documents

Guidance Documents

The Following Guidance Documents/Reports or similar up-to-date Guidance Documents/Reports as appropriate should be considered in the preparation of the Environmental Management Report.

Construction

- Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects: DEHLG 2006
- Connacht Waste Plan 2006-2011 and any subsequent plans
- Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors; CIRIA 2001

Surface Water

- Planning for SUDS-Making it happen; CIRIA 2010

Noise and Vibration

- BS 5228-1:2009 – Code of practice for noise and vibration control on construction and open sites – Part 1: Noise
- BS 5228-2:2009 – Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration
- http://www.epa.ie/downloads/advice/noise/Env%20Noise%20Survey.pdf Noise survey
- Practitioner handbook for Local Noise Action Plans – Recommendations from the EU Silence Project

Natural Heritage

- Fossitt, J.A. (2000) A Guide to Habitats in Ireland. Heritage Council, Kilkenny.
- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (as amended)
- http://www.npws.ie/en/PublicationsLiterature/RedLists/
- Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds (as amended)
- http://www.birdwatchireland.ie/
- Defra, 2008. *A compendium of UK peat restoration and management projects*
- Department of Environment, Heritage and Local Government. *Best Practise Guidelines on the preparation of Waste Management Plans for Construction and Demolition Projects*
- Irish Peatland Conservation Council, 2002. Factsheet – Raised Bogs [http://www.ipcc.ie/inforaisedbogfs.html]
- SEPA, 2010. *National Waste Policy Unit Publication; Peat Position Statement*
- Wetzel, R. G., 2001. *Limnology; Lake and River Ecosystems*. Elsevier Academic Press.

Energy

- http://www.seai.ie/uploadedfiles/publications/Building%20Energy%20Managers%20Resource%20Guide1.pdf
- Building Regulations 2008 Technical Guidance Document: Conservation of energy and Fuel – Building other than Dwellings
- EU BREF Guidance notes http://eippcb.jrc.es/reference/
- The energy-management standard EN 16001, based on the Irish standard IS 393, published in 2009.
- http://www.seai.ie/Your_Business/Large_Energy_Users/Resources/EnergyMAP/

- http://www.seai.ie/uploadedfiles/InfoCentre/SEIManagingEnergy.pdf
- http://www.seai.ie/Publications/Your_Business_Publications/Exterior_Spaces_Lighting_Guide.pdf
- http://www.epa.ie/downloads/advice/bat/ Best Available Technologies
- Building Energy Managers Resource Guide:
- http://www.seai.ie/Your_Building/BER/Your_Guide_to_Building_Energy_Rating.pdf
- http://www.seai.ie/Renewables/Renewable_Energy_Library/Non-Domestic_Passive_House_Guidelines.pdf
- http://www.seai.ie/Publications/Low_Carbon_Opportunity_Study/Irelands_Low-Carbon_Opportunity.pdf
- http://www.seai.ie/Publications/Your_Business_Publications/Exterior_Spaces_Lighting_Guide.pdf

Flood Risk

- The Planning System and Flood Risk Management, Guidelines for Planning Authorities, DoEHLG, 2009
- The Planning System and Flood Risk Management Guidelines for Planning Authorities; Technical Appendices; DoEHLG, 2009