Comhairle Chontae na Gaillimhe
Galway County Council

Strategic Environmental Assessment Environmental Report of County Galway Wind Energy Strategy

FINAL REPORT

November 2011

MINOGUE & ASSOCIATES
ENVIRONMENTAL & HERITAGE CONSULTANTS

1 Chapter One: Final Environmental Report

1.1 Introduction

Galway County Council is currently preparing a Wind Energy Strategy (WES). It is the intention that this will be adopted as a variation of the existing Galway County Development Plan 2009 to 2015. ***The WES was adopted in September 2011 by Galway County Council and this is the Final SEA ER. It is accompanied by the SEA Statement and a Habitats Directive Assessment***.

1.2 Strategic Environmental Assessment (SEA) and this Environmental Report

SEA is a key process that promotes sustainable development and highlights significant environmental issues within the planning regime. The purpose of SEA is to formally and systematically evaluate the likely significant effects of implementing a plan or programme, in this instance the Draft WES. SEA is an iterative process and has informed and influenced the preparation of the Draft WES.

This Environmental Report forms part of the SEA on the Draft WES. The purpose of this Environmental Report is to identify, describe, and evaluate the likely significant effects on the environment of implementing the proposed Draft WES and should be read in conjunction with the Draft WES itself.

This Environmental Report is not the SEA, rather it documents the SEA process and is the key consultation document in the SEA process and facilitates interested parties to comment on the environmental issues associated with the Draft WES.

Schedule 2B of S.I. 436 of 2004 details the information to be contained in an Environmental Report. The following section lists the information required and details where this information is contained in this Environmental Report.

(*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 outlines contents and main objectives, and how they were developed; 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 implementation of the plan*; Chapter Four Baseline Environment provides this information.

(*c*) *the environmental characteristics of areas likely to be significantly affected;* Chapter Four Baseline Environment provides this information.

(d) any existing environmental problems which are relevant to the plan including, in particular, those relating to any areas of a particular environmental importance,

such as areas designated pursuant to the Birds Directive or Habitats Directive; Chapter Four Baseline Environment provides this information.

(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 provides 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 or lack of know-how) encountered in compiling the required information*****;** Chapter Six, Alternatives Considered provides this information and difficulties encountered are listed at the end of Chapter Four, 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.

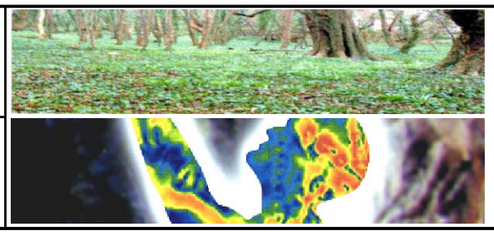
(*j*) a *non-technical summary of the information provided under the above headings*.
This is provided in a separate document to this Environmental Report but is also available.

1.3 County Galway Wind Energy Strategy Area

County Galway is located in the province of Connaught and is on the west coast of Ireland. It shares a number of geographical boundaries with neighbouring counties, including the Sliabh Aughties range with County Clare, River Shannon and Lough Derg with Counties Clare, North Tipperary, Offaly and Roscommon; and Lough Corrib with County Mayo. County Galway is the second largest county in Ireland with an area of 6,148 square kilometres and a population of 231,035 persons as of Census 20064, 159,052 of which live in the administrative area of Galway County Council and 71,983 of which live in Galway City[1].
Figure 1 shows the geographical location of the County and presents the key settlements, water resources, upland areas, and transport routes.

[1] Source: SEA ER of County Galway Development Plan 2009

DATE: 04/04/11	SCALE: 1:400,000	**FIGURE 1: LOCATION**	
REF: WES/xx	SIZE: A3	Galway County Council Wind Energy Strategy	
DRAWN: EV	APPROVED: RM		



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1.4 Background to current Wind Energy Strategy in County Development Plan 2009 to 2015

Galway County Council (GCC) has prepared a **Wind Energy Strategy** (WES) for County Galway. The strategy provides strategic direction to encourage renewable energy and to guide the siting and design of wind energy developments in appropriate locations within the County. County Galway has significant wind resources and a key priority of the WES is to identify sites of strategic, national and regional importance that have the potential to accommodate wind energy development.

The WES revises and updates the areas of wind farm potential identified in the *Galway County Development Plan* (GCDP) *2009-2015*, in particular those shown in Map IS1. This has been undertaken in accordance with Objective IS19 of the GCDP and accordingly reviews areas of wind farm potential having regard to protected sites, habitats and species and other environmental, landscape, infrastructural and settlement considerations. The WES will be adopted as a variation to the existing GCDP 2009-2015 following consideration of written submissions received from the public and other stakeholders.

The existing Wind Resource Zones identified in the GCDP were developed from research undertaken as part of the *Landscape and Landscape Character Assessment for Galway County 2002* prepared on behalf of GCC, which was used to identify appropriate areas for wind farm development. Therefore, the key considerations were the landscape and visual impacts of wind farm developments. Wind potential areas were identified as Strategic Areas, Areas for Consideration and No Go Areas.

In undertaking the current strategy, landscape and visual considerations have been considered in conjunction with a range of other factors, including the need to achieve greater energy security, achieving commitments at national and international level regarding reductions in greenhouse gases, promoting renewable energy, protected areas of high biodiversity and other environmental considerations. This WES will supersede the earlier guidance and will guide development for wind farms within the County during the lifetime of the GCDP 2009-2015.

This SEA and HDA have been prepared in tandem with, and have informed the WES. This WES builds upon existing guidance in the GCDP 2009-2015, taking account of updated national and regional planning guidelines, strategies and policy documents. It is also informed by issues of particular national, European and international environmental importance that have evolved, and are now accepted as being critical to the formulation and implementation of sustainable development, such as climate change, renewable and alternative energy.

This WES designates areas as being: a) Strategic Areas, b) Acceptable in Principle, c) Open for Consideration, and d) Not Normally Permissible. The total land area originally proposed as Strategic is 5390 ha, and the area proposed as Acceptable in Principle is 6994ha.

Following the two material amendments the final land areas as adopted by Galway County Council on 21st September 2011 are as follows:
The total land area proposed as Strategic is 5,393 hectares and the area proposed as Acceptable in Principle is 6,515 hectares. The area identified as Open for Consideration is 108,000ha.

The aims of the Wind Energy Strategy are to:

- Revise and update the existing guidance on wind farm potential contained in the existing *Galway County Development Plan 2009-2015* and to fulfil Objective IS9 of the GCDP.
- Develop a Wind Energy Strategy in light of the available national guidelines *Planning Guidelines for Wind Farm Development 2006* issued by the Department of Environment, Heritage and Local Government (DoEHLG, 2006).
- Reflect and plan for technological advances in wind farms over the next number of years.
- More closely align the County's wind generation policy to the existing wind energy resources.
- Support a plan led approach to wind energy development in County Galway predicated on the optimal harnessing of the County's wind energy resource, and at a minimum requiring that 40% of Galway's electricity needs can be met from renewable energy sources, including wind farms.
- Identify strategic areas for wind energy development of local, County, regional, and national importance.
- Work towards a target of 500 MW of wind energy in County Galway, to enable Galway to make the initial steps toward a low carbon economy by 2020. This target will enable Galway to generate the equivalent of over 70% ot its electricity needs from wind energy.
- Support County Galway in reducing CO_2 emissions associated with energy production, as identified in the *Galway Climate Change Strategy* prepared by the Galway Energy Agency (GEAL, 2001).
- Promote the economic development of wind energy and other renewables in the County, underpinning the need for energy security, the promotion and establishment of a low carbon economy and the development of green business within the County.
- Ensure the production of wind energy is consistent with and takes account of nature conservation and environmental legislation and targets, including the conservation and protection of the designated and proposed Natura 2000 sites and Natural Heritage Areas in and adjacent to the County.
- Ensure full compliance with the requirements of the *EU SEA Directive (2001/42/EC)* and the associated *SEA Regulations 2004 (SI No. 436 of 2004)* and *SEA Guidelines 2004* (DoEHLG, 2004).
- Ensure full compliance with the requirements of the *EU Habitats Directive (92/43/EEC)*, in particular the need for Appropriate Assessment, in line with the *Natural Habitats Regulations (SI No. 94 of 1997), Appropriate Assessment Guidelines*

2009 (DoEHLG, 2009) and the *Planning and Development Act 2000-2010*.

The SEA and Habitats Directive Assessment (HDA) have informed the WES through an ongoing iterative process that incorporated environmental considerations and sensitivities throughout the strategy development. The SEA and HDA is being undertaken in line with the Planning and Development (Strategic Environmental Assessment) Regulations 2004 to 2011 (as amended) and the European Union (Natural Habitats) Regulations 94 of 1999, as amended SI 233/1998 and SI 378/2005.

1.5 Structure of this Environmental Report

The remainder of this Environmental Report is structured as follows:

Chapter Two:	Methodology
Chapter Three:	Relationship to other policies and plans
Chapter Four:	Environmental Baseline
Chapter Five:	Environmental Protection Objectives
Chapter Six:	Alternatives Considered
Chapter Seven:	Likely Significant Effects on the Environment
Chapter Eight:	Mitigation Measures
Chapter Nine:	Monitoring
Glossary of Terms	
Abbreviations Used	
Annex A:	EPA SEA Process Checklist
Annex B:	***1st and 2nd Material Amendments Assessment against SEOs***

2 Chapter Two: Methodology

2.1 Introduction

The methodology used to carry out the SEA of the WES reflects the requirements of the SEA regulations and available guidance on undertaking an SEA in Ireland, including:

- SEA Methodologies for Plans and Programmes in Ireland – Synthesis Report Environmental Protection Agency (EPA) 2003,
- 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" published by the Department of the Environment, Heritage and Local Government 2004.
- Planning and Development (Strategic Environmental Assessment) Regulations 2004 (SI 436 and S.I 435 of 2004)
- ***Planning and Development (Strategic Environmental Assessment)(Amendment) Regulations 2011 (S.I. No. 201 of 2011), and***
- ***Planning and Development (Environmental Assessment of Certain Plans and Programmes) (S.I No 200 of 2011)***[1]
- SEA Process Checklist Consultation Draft 2008. EPA 2008.

This chapter presents the methodology in more detail.

2.2 Screening for SEA

The Planning and Development (Strategic Environmental Assessment) Regulations 2004 (SI 436 2004) Article 13K (1) states that:

'*Where a planning authority proposes to make a variation of a development plan under section 13 of the Act, it shall, before giving notice under section 13(2) of the Act, consider whether or not the proposed variation would be likely to have significant effects on the environment, taking into account of relevant criteria set out in Schedule 2A'*

In taking account of the criteria set out in Schedule 2A in SI 436 of 2004, Galway County Council has determined that the variation would be likely to have significant effects on the environment and therefore the draft WES is subject to a SEA.

2.3 Consultation

Pre-Draft Consultation with External Stakeholders Submissions were invited from statutory bodies and key agencies involved in energy. Submissions were received from the following agencies within the specified timeframes:

[1] These regulations were introduced over the course of the WES development and were inserted following submission from EPA.

Table 2a Pre consultation Submissions

Submitted By	Issues Raised	Response
Mayo County Council	• Mayo County Council (MCC) has prepared a draft Renewable Energy Strategy (RES) 2010-2020 for Co. Mayo. • Request that when GCC considering locations for wind energy developments in Co. Galway, the environmental designations, including listed views and scenic viewing points in Co. Mayo particularly along or in the vicinity of south western boundary of Co. Mayo and Lough Mask be protected. • Copy of Map 8 SAC, NHA, SPA and Map 10 Scenic Views of the Mayo CDP 2008-2014, along with Map 1 Wind Energy from the draft RES 2010-2020 for information.	• Designated sites have been considered up to 15km from Co. Galway boundary. • Mayo WES, RES and environmental designations have been considered in drafting the WES.
Inland Fisheries Ireland	• Wind energy development should consider impact on salmon fisheries, particularly in upland waters that are of importance as fishing spawning and nursery zones. • Slamon is an Annex 2 species under Habitats Directive and included as a qualifying interest in many SACs. • Schedule 2 of Wild Salmon and Sea Trout Tagging Scheme Regulations 2009 list names of all nationally important salmon rivers. In Galway Fishery District, this includes the following rivers: Corrib, Aille (Galway), Kilcolgan, Clarinbridge, Knock and Owenboliska R (Spiddal). In Connemara Fishery District, this includes the rivers of Cashla, Screebe, Ballynahinch and L. Na Furnace. • Number of wind farm projects have been approved in Owenboliska catchment and planned ESB Networks 110kV cable between Galway and Screebe may give rise to further applications within this zone. Concern regarding magnitude of potential impacts, particularly that excavation may give rise to mobilisation of peat particles that could smother salmonid ova, clog fish gills and generally become a chronic feature of our fisheries. • Salmon and brown trout spawning and nursery rivers should be afforded similar protection to pearl mussels, for which a more restricted approach has been adopted due to their perceived sensitivity to silt. Salmon, sea trout and brown trout spawning rivers should be fully protected to safeguard nationally important fishery resources.	• WES considers fishery impacts, provides for protection of fish species and the environment and includes development management guidelines on how this should be addressed in planning applications. • Specific measures have been developed relating to water quality and construction impacts and freshwater pearl mussel.
EPA, SEA Section	• GCC to determine any significant environmental effects of WES and should consider SEA Directive (including Annex II) and Schedule 1 of SEA Regulations. • Consider potential for development of wider RES, such as being carried out by Clare and Mayo County Councils.	• GCC undertaking SEA and HDA screening for WES. • GCC considering preparation of RES following WES.

	• Consider existing WESs that have been subject to full SEA and AA, e.g. Clare and Waterford WES. • Consideration should be given to undertaking a full SEA given likelihood for potential significant environmental effects, including cumulative effects. • Referred to responsibilities in relation to national and EU environmental legislation. Strategy should include, where appropriate, policies and recommendations of GCDP (and associated SEA and AA) and Regional Planning Guidelines 2010-2022. • Reminded of requirement, where appropriate under SEA Regulations, to give notice to environmental authorities, including DoEHLG in relation to significant effects on built heritage or nature conservation and DoCENR in relation to significant effects on fisheries or marine environment. • A copy of decision regarding SEA determination should be made available for public inspection and notified to any environmental authorities.	• WES takes account of relevant national and EU legislation, including SEA Directive and Habitats Directive. • Environmental authorities will be consulted as part of SEA process.
Shannon Airport	• Dublin Airport Authority plc (Shannon Airport) has statutory responsibility for airport operation, management and development under Air Navigation and Transport (Amendment) Act 1998. • Due to distance of Shannon Airport from Galway, direct implications of properly planned and sustainable wind farm development in Co. Galway for Shannon Airport most likely to be negligible. • Typical types of concerns airports in general have in relation to wind developments include: potential impacts from the location of wind farm developments in vicinity of an airport which could have serious implications for safeguarding of aerodrome; and potential interference with airport navigational aids, including radar systems, as a result of wind turbine operation and rotating blades. • Responsibility for operation and maintenance of airport navigational systems rests with Irish Aviation Authority (IAA) and comments should be sought from IAA in respect of wind farm development in Co. Galway and geographically relevant airports (Galway and Knock).	• WES includes guidance in relation to safeguarding aerodromes and protecting airport navigational aids. • IAA will be consulted as part of the statutory process of publishing and adopting the WES. • Galway Airport was invited to comment at pre-draft stage but no comments were received.
West Regional Authority	• Grid transmission network is a key limiting factor to harnessing of wind energy in Galway and West Region. Grid network requires strengthening and addition of new high voltage transmission infrastructure. Galway WES should take cognisance of actual grid capacity in identifying suitable locations for wind energy development over lifetime of WES (or short term). Where there is information on timescales for future connections, suitable areas may be	• WES has considered policies, objectives and guidance in RPGs, including those in relation to wind and renewable energy. • WES considers grid capacity in identifying targets and suitable areas for wind energy development.

	identified for development in medium or long term. • Offshore wind energy needs to be considered in terms of linking to mainland and identifying suitable areas for connection where information is available. • Micro generation or one-off turbines for domestic use may become a more common occurrence in countryside and WES should contain a policy in relation to assessment of cumulative effects of such structures. • WES should include basic details on Gate System and there are issues regarding acquiring Gate connections, planning permission and financing. • Objective CO14 of RPGs supports identification of wind energy development applications through HDA. Objective IO54 of RPGs states that "Natura 2000 sites, and other ecological sites, should be placed in the 'not normally permissible' category unless project level HDA and/or other relevant environmental assessment determines otherwise…". • SEA and HDA reports prepared as part of RPGs available on Regional Authority website and may be useful for environmental assessment of WES. • RPGs contain objective to initiate a Regional Energy Strategy for West Region, which will be a subsidiary strategy to RPGs, and contributions from GCC on this strategy would be welcomed. • GCC should consult with surrounding Local Authorities of Clare, Mayo, Offaly, Roscommon and Tipperary County Councils, Local and Regional Energy Agencies, SEAI and Erigrid/ESB as part of process. • Submission includes an Appendix with key policies, objectives and some relevant sections from RPGs in relation to wind and renewable energy.	• WES considers offshore wind energy development, mainly in relation to onshore implications due to jurisdictional boundaries of GCC. • WES policy considers cumulative effects of small scale projects. WES contains information on Gate system. • SEA and HDA being prepared for WES, which will inform suitable areas. • All Natura 2000 sites have been placed in Not Normally Permissible Area, as have majority of NHAs. • GCC invited submissions from surrounding Local Authorities at pre-draft stage and received submissions from Clare, Mayo and Roscommon County Councils. Further consultation will take place as part of statutory process.
NRA, Policy Adviser (Planning)	• No specific comments but refers GCC to official policy in relation to development on/affecting national roads and requests GCC to have regard to provisions of Spatial Planning and National Roads (Draft) Guidelines for Planning Authorities in preparation of WES.	• WES refers to Draft Guidelines and includes guidance in relation to development accessing/on/affecting national roads to ensure protection of national road investment.
Coillte , AP McCarthy	• Coillte has significant interests in Co. Galway, including a substantial land resource, and significant involvement in renewable energy production. • Co. Galway has an excellent wind resource with very significant wind energy potential that is largely unrealised to date. Also significant population centres that create demands for electricity. Galway has relatively good grid connections available in parts of County but also significant environmental areas. • Policies and objectives in WES should be proactive in promotion and facilitation of wind energy proposals at appropriate locations, having regard to wind	• WES has considered factors identified in submission as well as others and includes guidance on suitable areas for wind energy development based on these factors. • Natura 2000 sites have been excluded from suitable areas and a range of other settlement, environmental, landscape, etc. factors have been considered.

	resources, potential access to grid and environmental assets. • Use of targets is necessary to focus attention on urgent need to secure delivery of WES and must identify strategic and preferred areas to provide clarity and reduce delays progressing developments. • Identification of strategic and preferred areas for wind energy production primarily based on: 1) an optimum available wind resource; 2) potential access to grid; 3) low population densities; and 4) designated Natura sites. • Optimum wind resources concentrated west of Corrib and some additional areas south of County. • Grid connections are key and need to consider Eirgrid plans and its Grid 25 Strategy. WES should consider broad infrastructure corridors where significant electricity transmission exists, is planned or is acceptable in principle and new connections to the grid. • Considering the above factors, much of County is unsuitable for significant wind energy production, particularly low lying and settled central and eastern parts, including most of Connemara and Slieve Aughty's. • Remaining large tracts that are suitable should be considered as strategic areas. Also other smaller or fragmented areas where individual sites and clusters should be promoted. • Wind speed map in submission does not seem to match SEA Wind Atlas map in WES.	• WES includes policies and objectives to support and encourage wind energy development in appropriate locations.
Fáilte Ireland, Environment and Planning Unit	• Need to strike a balance between maintenance of landscape character and scenery in County as a tourism asset and facilitating wind farm development to meet EU GHG reduction targets. • Failte carried out a survey of overseas and domestic tourists during 2007 to assess attitudes of visitors to Ireland of onshore wind farms but excluded offshore wind farms and overhead power lines. This revealed that awareness of wind farms was high, most were broadly positive towards more wind farms but about one in seven negative to wind farms in any context, most felt that did not detract from quality of sightseeing, although perception of impact was higher in coastal areas and other locations with higher perceived beauty such as mountains. • Landscape and scenery is key to tourism and overseas visitors and National Parks and areas of scenic importance should be avoided for wind energy development, particularly Connemara National Park, much of Connemara itself and Lough Corrib.	• WES has considered attitudes of visitors as set out in Failte study (FI, 2008), SEI study (SEI, 2003b) and DoEHLG guidelines (DoEHLG, 2006). • Identification of wind energy areas has considered tourism and recreation assets and aims to protect Connemara National Park, coastal areas, much of Connemara, Lough Corrib, valuable landscape character, etc. • WES considers impacts of wind farms and associated infrastructure at strategic level.

	• WES must consider cumulative impact of numerous wind energy developments and SEA is essential as larger wind farms or clusters of turbines in one location, the more likely that visitors will react negatively. Key question is how many wind farms would a visitor encounter in Connemara if potential for development outlined in WES is realised? This will involve assessing likely visibility of wind farms from key tourist routes such as N59 and R336, which should be included in SEA. • Necessary transmission infrastructure associated with wind energy developments should be considered as there is significant potential to impact on landscapes of national scenic importance and areas of tourism amenity if not appropriately sited.	
Irish Wind Energy Association	• Co. Galway has high average wind speeds and has opportunity to make meaningful contribution to energy security and combating climate change in Ireland and national targets and policy for renewable energy. • Large scale expansion of wind energy industry sector will have major economic benefits in terms of job creation. • Major challenge to meet 40% target from wind, which will require around 5,000 MW of additional wind capacity, by 2020. • Identification of suitable zones should consider wind resources, separation distances from residences and sensitive buildings, nature and habitat status of surrounding landscape, DoEHLG wind guidelines and RPGs. • IWEA acknowledges positive role of GCC in terms of achieving national targets. • Sufficient wind resources are essential but increases in hub heights and rotor diameters will allow less windy inland sites to also be exploited. There is 8 times more energy in wind with a speed of 10m/s than 5m/s as energy is a cubic factor of speed. • Wind farms could be considered in designated sites where they would have little or no impact if construction process is managed in a sensitive manner. Wind energy developments should be considered on individual merits rather than a presumption of incompatibility with designated area. • The DoEHLG guideline of 500m from neighbouring 3rd party properties should be a critical factor in zoning of areas for wind farm development. • Larger and more efficient turbines increase ability to meet targets, reduce amount of turbines needed and reduce amount of raw materials needed. • Wind projects can coexist successfully with other land uses, including forestry, food production and livestock grazing and approximately 96% of landholding	• WES recognises wind potential of Co. Galway and importance of its potential contribution to energy security, climate change measures, etc. • WES considers adequate separation distances based on national guidelines and other informants. • WES identifies targets and suitable zones for wind energy development. • RPGs state that Natura 2000 sites and other ecologically sensitive sites should be placed in Not Normally Permissible category. • DoEHLG guidelines, including 500m separation distance, has been considered and incorporated into Draft WES. • WES provides guidance for a range of turbine sizes, to be suitable to landscape context and visual impact. • WES identifies need for adequate infrastructure and highlights important potential corridors for grid connection. • WES does not require underground cables as a policy requirement but this can be considered on a case by case basis. • WES encourages a collaborative approach

	remains free from infrastructure and can accommodate such agricultural practices. • Highlight importance of grid infrastructure and recommend that WES facilitate provision of energy networks. Ideally, grid corridors should be highlighted, which should consider where wind projects are consented. IWEA encourages clustering of wind farm projects adjacent to existing or permitted gridlines to minimise amount of grid infrastructure needed. • Underground cable options are not policy of system operators as overhead powerlines provide a more secure electricity supply, avoid environmental and technical concerns with trenching for underground cables and are cheaper to install. • Electricity system operators and developer should work with planning authority on a case by case basis to develop most environmentally and technically effective options for connecting a wind farm to grid.	between system operators, developers and local authority.
ESB Wind Development Limited	• Support existing Derrybrien wind farm site in south Galway, which is currently owned and operated by ESB. • Derrybrien site is designated as a Strategic Area in GCDP 2009-2015, which reflects fact that the wind farm has operated successfully since 2005. • Methodology employed in GCDP provides a proper framework to promote appropriate wind farm development in County and designation of Derrybrien site as a Strategic Area is suitable and should be retained to ensure consistency with previous assessments on the site.	• WES reviews previous guidance in GCDP and provides new guidance based on national and regional guidelines and developing considerations. In particular, designation of site as a SPA, requirement under RPGs that such sites be included in Nor Normally Permissible category has resulted in a change in designation of these lands.
Clare County Council	• Development of many large scale projects will need combined cooperation and resources neighbouring counties, e.g. Galway projects utilising infrastructure originating in Clare. • WES should consider Natura 2000 sites and NHAs along north Clare/South Galway County boundary and potential for transboundary, in-combination and cumulative effects. • CCC looks forward to working with GCC and other agencies in development of a sustainable and integrated policy and approach to wind energy development in Mid-West and Western region.	• WES considers infrastructure required for wind energy development. • SEA and HDA will consider potential impacts on Natura 2000 sites and NHAs. • GCC will continue to consult and liaise with CCC in relation to formulation and implementation of WES.
DoEHLG Architectural Heritage	• WES should give due consideration to impact on architectural heritage of county and wider surrounding areas, particularly in SEA and environmental assessment of individual wind energy projects. • Recommend that GCC Conservation Officer be consulted in the matter.	• Architectural heritage has been considered in WES, SEA and in guidelines for environmental assessment of individual planning applications.

		• GCC Conservation Officer has been consulted as part of preparation of Draft WES.
DoEHLG Natural Heritage	• WES requires AA in respect of Natura 2000 sites. Appendix I of submission includes additional more detailed observations regarding AA, including provisions of Habitats Directive, NPWS data, key guidance available, 15km screening area recommended for Natura 2000 sites, consideration of all potential effects, revisions to WES in event of adverse effects, need for suitably qualified ecologists, consideration of in combination plans and projects, consultation with Regional Authority, clear guidance on lower level assessment, special attention for (sub) catchments of Natura 2000 sites elected for conservation of Annex II species and Freshwater Pearl Mussel (including sub-basin plans) and subjecting changes to WES to AA and SEA screening with updates to relevant reports as necessary. • WES should also ensure conservation of designated NHAs, proposed NHAs, Nature Reserves, Refuges for Fauna and National Parks. • WES should take account of species of flora and 'strictly protected' animals (Habitats Directive Annex IV species) subject to special protection measures. • WES should provide for conservation of other plant or animal species, or sites that are of special biodiversity importance (e.g. species that are of concern because of their status nationally, e.g. bird species listed as 'red' or 'amber' in BoCCI, Annex I Bird Species; or sites that may be special for biodiversity at a local level within the county). • All sites with nature conservation designations (SACs, SPAs, NHAs, including proposed and candidate sites, and National Parks and Nature Reserves) should be excluded from 'acceptable in principle', 'strategic', 'preferred' or similar wind zones. Whilst such sites may be included in 'open to consideration' category, it should be highlighted that generally projects will have to be subject to comprehensive AA or Ecological Assessment when locating projects in, or likely to impact such sites. • WES will also require SEA. Appendix II of submission provides additional more detailed observations regarding SEA Environmental Report, including need for suitably qualified ecologists, integration with AA, adequate scope to cover all biodiversity issues, need for basic information on ecological sensitivities of lands before areas are identified for renewable energy developments and inclusion of strategic environmental objectives for nature conservation sites and protected species.	• GCC is undertaking full SEA and AA screening/ full AA as appropriate to comply with all relevant statutory requirements and inform WES. These assessments will consider and address issues raised in submission. Results of these assessments will be addressed in Draft WES before publication. • WES has considered designated sites and species and habitats requiring protection in drafting policies, objectives and guidance. • Natura 2000 sites have been placed in Not Normally Permissible category. Majority of NHAs have also been placed in this category, some parts have also been included in Open to Consideration category but projects would be subject to more detailed assessment before decision to permit planning would be considered.

	• Appendix III provides observations regarding general issues, including consideration of offshore wind energy developments, consideration of WES for Clare (including recent amendments) and RES for Mayo, European Commission guidance on wind energy developments in Natura 2000 sites, potential for micro-renewables to have adverse effects on certain protected species and habitats, carbon costs associated with locating projects on peatlands and requirement for IPPC licences from EPA for Bord na Mona cutaway peatlands.	
Roscommon County Council, Brian Farragher, Planning Officer	• Roscommon County Council is preparing a WES and this should be published early this year. • Request that GCC consider the proposed wind energy development suitability designations of all lands in Roscommon that border Co. Galway.	• Roscommon Draft WES 2011 and wind energy designations have been considered in preparation of Draft WES.

Acknowledgements were received from the following agencies:

- Department of Communications, Energy and Natural Resources
- Office of the Minister for Agriculture, Fisheries and Food
- Office of the Minister, Environment, Heritage and Local Government
- Office of the Tánaiste and Minister for Education and Skills
- Minister for Enterprise, Trade and Innovation
- Dublin Airport Authority (no comment to make at this time)

2.4 SEA Scoping and Consultation

Following the screening process, a scoping exercise was undertaken by Minogue and Associates. This established the scope and extent of the Environmental Report and facilitated consultation with the designated statutory consultees- the Environmental Protection Agency (EPA), the Department of Environment, Heritage, and Local Government (DoEHLG), and the Department of Communications, Marine and Natural Resources (DCMNR). In addition, a further 16 non statutory consultees were consulted.

At the outset of the scoping process, statutory and non statutory consultees were consulted in the form of a letter outlining the new wind energy strategy, its intended lifespan, and a map showing the existing wind energy designations from the Galway County Development Plan 2005 to 2011. Thereafter, a number of informal follow up meetings took place with Galway County Council, the EPA and the National Parks and Wildlife Service (NPWS).

The environmental issues raised through this scoping process are presented below in *Table 2b*.

2.5 Environmental Issues raised during the scoping process

The table below presents the key environmental issues arising from the Scoping Process. It also shows where and how this issue has been addressed in the draft WES, the SEA ER and/or the HDA.

Table 2b: Environmental Issues raised during the scoping process

Consultee	Issues Raised	Addressed in WES SEA
EPA	SEA Pack and Scoping Guidance provided. In addition, specific comments on scoping of the WES: 1. The potential for likely significant effects should consider the phasing of proposed wind energy developments 2. Others plans/programmes for consideration include: • Western Regional Planning Guidelines 2010-2022 • Western and Shannon River Basin Management Plans and Associated Programme of Measures • Offshore Renewable Energy Development Plan • Grid 25 • Fresh Water Pearl Mussel sub basin management plan • Adjacent County Development Plans and associated SEAs 1. Adjacent local authority wind/renewable energy	Chapter 7 of this ER addresses phasing issues. Chapter 3 of this ER considers these and other influential plans/programmes etc. Adjacent wind/renewable energy strategies are being

	strategies should be consideration. 2. To ensure an integrated approach policies /objectives of adjacent local authorities should be taken into account 3. In assessing landscape character, seascape and coastscape should be included in line with European landscape convention definition. Consideration should be given for protection of designation regional landscape character areas) 4. Reference to recent EU Guidance in relation to Wind Energy Developments and Natura 2000 sites (2010) 5. SEA and HDA should assess full range of environmental effects set out in relevant Directives. Potential cumulative and in combination effects associated with other relevant plans, programmes and projects should be assessed. Effects associated with construction, operation, maintenance and decommissioning phases of wind energy development should be accounted for. Impacts associated with infrastructure such as roadways, site investigations, powerlines should be taken into consideration. 6. SEA Directive requires reasonable and realistic alternatives for development scenarios 7. Reference to Wind Energy Guidelines and ensured the developments are subject to EIA including visual impact assessment, AA and commitment to same in the Strategy. 8. Potential impacts on designation national and international sites within and adjacent to strategy area should be assessed. Water Framework Directive protected areas (salmonid rivers, shellfish areas and nutrient sensitive rivers etc) should also be afforded significant protection in implementing the Strategy 9. A commitment should be given to require AA screening for all plans etc which may arise in implementation of the Strategy 10. Galway County Biodiversity Action Plan and available habitat mapping should be integrated. Impact on protect species including birds etc should be assessed 11. Impact on aircraft flight paths to and from regional airports should be assessed.	considered in Chapter 4 and Chapter 7 of this ER. Where identified Regional Landscape Character areas will be assessed. Seascape and Coastscape will be described and assessed where appropriate. Noted and reference will be made to these guidelines both in the SEA ER and HDA. Noted and cumulative and in combination effects will be assessed in Chapter 7 of this ER and in the HDA. Noted and will be assessed in Chapter 6 of this ER Noted and reference and commitment to same included in WES and ER These will be assessed as part of the SEA and HDA Noted and included in the draft WES - see Objective WE10 Noted, this data is included in Chapter 4 of this ER Noted, consultation with DAA has commenced and flight paths will be considered in this ER.
DoEHLG	Comments relating to archaeological heritage. The following should be considered in assessing potential impacts: 1. Valletta Convention 1992, National Heritage Plan 2002 Framework and Principles for protection of archaeological heritage 1999 County Development Plans and Local Area Plans	Noted, and referenced in Chapter Three

	2. Record of Monuments and Places and national monuments; 3. Zones of visual influence should be identified for national monuments 4. Any direct impacts on national monuments or subject to preservation order will require Ministerial consent 5. Areas of high archaeological potential should be identified www.excavations.ie for further information 6. Potential of coastal and intertidal zone, as well as riverine archaeology should be investigated.	
DCMNR		
Inland Fisheries Ireland	Noted that with any significant expansion into important salmon fisheries there is potential for impact. Especially in upland waters of importance as fish spawning and nursery zones. Data provided on all nationally important salmon rivers. Salmon an annex 2 species under Habitats Directive and included as a qualifying interests in many SACs and surprisingly not listed as qualifying interest in Connemara Bog SAC. Number of wind farms approved within the Owenboliska Catchment and ESB 110kv cable (Screebe) may give rise to further applications. Difficult to gauge magnitude of impact until such protects are constructed and operational. Main concern is that despite best efforts, planning and mitigation, associated excavations may give rise to mobilization of peat particles that could smother salmonid ova, clog fish gills and become chronic feature of fisheries. Notable that presence of pearl mussel in certain catchments has been cited as reason for adopted more restricted approach because of their perceived sensitivity to silt; it is submitted a similar rating should be afforded to the protection of salmon and brown trout spawning and nursery rivers.	Noted and will be described in Chapter 4 Baseline and Chapter 7 Significant Effects in this ER. In addition, the HDA will assess in more detail specific Annex 2 species present. In combination effects of plans and projects are assessed in Chapter 7 of this ER. Noted and will be assessed based on best available data and knowledge. Noted and will be included as part of the assessment of effects.
The West Regional Authority	SEA Amended Environmental Report for the new Regional Planning Guidelines may contain useful sources of baseline information. The AA Screening and Natura Impact Statement for same may also be useful. Recommend that: 1. DoEHLG AA Guidance be included in national plans and programmes 2. Additional data sources may be useful: 3. Population – planning statistics, RPGS and CDP 4. Flora and Fauna – Natura 2000 site information and RPG AA documents 5. Water – local authority, EPA and Inland Fisheries Ireland 6. Air – additional data source includes the EPA 7. Material assets – additional explanation includes the impact on roads infrastructure	Noted and relevant baseline information from these reports will be used. Noted and will be included in Relevant Plans and Programmes Additional data sources are noted and will be used in the SEA in particular in Chapter 4 Baseline Information.
Roscommon County	Considered that significant environmental issues for a WES have been addressed in Table 3f of the Scoping	Noted

Council	Report Roscommon County Council has published draft WES and is preparing a Managers Report on submissions received. Request that environmental designations in Roscommon are duly considered.	Roscommon draft WES and supporting documents including SEA and HDA and environmental designations will be included and assessed in ER
Clare County Council	Notes and agrees with issues and contents to be included in scope of proposed SEA and HDA. Would request the following: • In combination effects, cumulative effects and transboundary issues, particularly relating to Co Clare be taken into consideration. • Clare WES SEA and HDA may be of benefit • Please reference Clare WES 2011 -2017 as a plan and policy considered under Section 3.1.6 of SEA Scoping.	Accepted, such effects are considered where appropriate in Chapter Seven. This information is being used for baseline information Noted and has been included.
Mayo County Council		
Shannon Airport	No additional comments to make at this stage.	
Birdwatch Ireland	Welcomes strategic approach to wind energy. Key comments: 1. WES should undergo an Ecosystems Services Assessment as identified by the TEEB initiative www.teeb.net 2. SEA and HDA should take account of the following; 3. Local, regional and national significance of Galway's biodiversity 4. Conservation objectives of key species including eg: hen harrier and key sites protected through designations especially Birds Directive and Habitats Directive 5. Need to protect habitats for species of conservation concern both within and outside protected areas 6. Ecological requirements of species for which Galway is important, eg: flyways for wintering waterbirds, foraging behaviour of tern species 7. Reference to ECJ Ruling 2007 re: Birds Directive and Habitats Directive. Recommend that potential adverse impacts of the proposal are fully considered ensuring informed decision making. 8. Particular areas of concern: • Species listed on Annex 1 and migratory wetland bird species afforded protection in wider countryside as well as in SPAs • Red and amber listed birds identifiented as Birds of Conservation Concern (2007) • Priority habitats for wild birds including uplands, wetlands, hedgerows, machair, coastal habitats, semi natural woodlands, riparian habitats in	Noted, but unlikely to undergo this assessment within timeframe or scope of SEA and WES. Biodiversity at all levels will be included in SEA and where relevant the HDA. HDA in particular will scrutinize conservation objectives, habitats, and ecological requirements. Noted and all potential adverse impacts will be assessed through SEA and HDA process, in particular Chapter 7 of this ER.

	addition to habitats specified under Annex 1 of EU Habitats Directive • Designated sites – appropriate protection and buffering of sites for wild birds and their habitat requirements to ensure conservation objectives can be achieved.	
Bat Conservation Ireland	Currently formulating best practice guide for wind energy and bats with Irish Wind Energy Association. Principal concerns relate to: 1. High flying bats/aerial feeding bats colliding with turbine blades 2. Wind turbines sited along migratory routes 3. Impacts on tree roosting bats 4. Wind turbines cited too close to foraging and commuting habitats 5. Nathusius pipistrelles, common pipistrelle, soprano pipistrelle and Leislers Bat considered to be potentially affected by wind turbines. 6. Provides reference to UNEP/EUROBAT guidelines on bats and wind energy – key issues including site selection being the most important consideration, buffer zones also essential mitigation measure. 7. Note bats are protected species under a range of legislation and plan objectives including National Biodiversity Plan 8. 200m buffer from vegetation recommended but can be reduced if substantial evidence that bats not flying within this zone. 9. Additional reference provided from Natural England Technical Information note: TIN051 – allows for 50m buffer minimum distance from blade tip to nearest habitat feature. 10. Highest risk groups – Leislers and Nathusius pipistrelle, medium risk – common and soprano pipistrelle. 11. 2011 research project – priority landscape for Bats in Ireland. 12. General information given on bats in Ireland including habitats	Noted and such guidelines will be referenced in WES, SEA and HDA. Concerns noted and will be discussed and assessed in SEA particularly in Chapter 7. As covered under Habitats Directive, potential impacts on bats will be assessed through the HDA process also. References and research projects noted and welcomed and will be included in mitigation measures where appropriate
National Roads Authority	1. Recommendations provide general guidance on preparation of plans which may affect the national roads network: 2. Regard should be had to locations of existing and future national road schemes and impact thereon 3. EIS and conditions by An Bord Pleanala re; road schemes in the area, potential cumulative impacts also 4. Significant impacts developments may have on human beings due to proximity to national route: safety, noise, air etc 5. NRA Environmental Assessment and	Chapter 4 of this ER will provide information on existing national roads. Combination effects will address where new road schemes are planned in Chapter 7 of this ER. Guidelines and Noise Regulations are noted and will

	Construction Guidelines 6. Consider how Environmental Noise Regulations and future action plans. 7. Transport assessments may be required for key development areas 8. Visual impacts to and from the existing and proposed national road	be referenced in WES and SEA Noted, this may be more appropriate at project level. Noted, LCA for County Galway identifies key views and prospects. Draft WES includes setbacks from existing and proposed national roads. Additional modeling may be undertaken.
Irish Peatland Conservation Council	Recognizes importance of increasing renewable energy sector but cannot support developments that would result in destruction of rare peatland habitats. 1. IPCCs Peatland Sites Database – 90 sites identified for Galway (29 are SACs, 35 NHAs and 26 non designated sites) Name and grid reference provided for these. 2. All sites designated SAC/NHA/pNHA should be classed as not normally permissible. 3. Would request that stringent guidelines be set down ensuring detailed ecological assessment be carried out on all proposed peatland development sites. 4. Disappointed with omission in new plan of 'No Go Areas' 5. Importance of protecting blanket bog habitat – accounts for less than 3% of the world's peatlands. Only 27% of original area of blanket bog in Co. Galway is intact. Responsibilities under EU Habitats Directive and Ramsar Convention 6. Highlight incidences of bog bursts occurring during construction of wind farms and associated works including: Derrybrien, Co Galway, Stacks Mountains Co Kerry and Corrie Mountains, Co Leitrim. Lack of adequate peat stress testing during the Environmental Impact Assessment (EIA); EIAs often do not assess construction impacts of ancillary works such as road construction. 7. Proper planning regulations and BOGLAND	Noted and accepted. The WES does not include any designated sites in strategic or acceptable in principle areas. This database is very useful and non designated sites will be integrated into GIS. Mitigation measures in the SEA ER and WES are developed to address particular sensitivities associated with peatland development sites No Go Areas have been replaced with Not Normally Permissible in the Draft WES based on DoEHLG Planning guidelines for Wind Energy Development Noted and accepted. Issue of bog bursts and landslides are acknowledged as an significant concern and specific guidelines and requirements regarding EIA and bog bursts are presented in the WES and Chapter Eight of this SEA ER Noted and relevant information will be integrated into this SEA ER

	project undertaken by EPA and UCD.	

1.1.1 Public Submissions on the Draft WES, SEA ER and NIR

The draft WES was put forward as a variation to the Galway County Development Plan (GCDP) 2009-2015 (Variation No. 2) in accordance with Section 13 of the Planning and Development Act 2000 (as amended). The draft WES and the SEA and HDA reports were put on public display on 9th May 2011. Public notices were published in newspapers and on the Council website, with copies of the draft WES and supporting documents on display in the County Buildings, Area Offices, Branch Libraries and on the Council website. Copies of the draft WES, together with the SEA and HDA documents, were also sent to the various statutory bodies and the elected members of Galway County Council.

A period of 4 weeks was provided for written submissions, commencing on Monday 9th May 2011 and closing on Tuesday 7th June 2011. A total of 26 submissions were received during the statutory consultation period. The 26 submissions include submissions from statutory bodies, service providers, the general public and other stakeholders. Of the 26 submissions, the following submissions had an environmental focus:

- ***Inland Fisheries Ireland***
- ***Department of Arts, Heritage and the Gaeltacht***
- ***West Regional Authority***
- ***Geological Survey of Ireland***
- ***An Taisce***
- ***Coillte***
- ***National Roads Authority***
- ***Clare County Council and***
- ***Health and Safety Authority, and***
- ***A number of individual submissions related to site specific issues.***

Principal environmental recommendations to the SEA ER and to the WES were related to the following environmental parameters. Further information on the changes made to the SEA ER from this consultation period can be found in blue bold italic font in this SEA ER, principally in Chapters Four Baseline Information and Chapter Eight Mitigation Measures. Information more generally on all the submissions from this period can be found in the Managers Report dated 30th June 2011.

Key environmental issues that have been included in the SEA ER and adopted into the WES as appropriate include:

- ***Additional baseline information on fisheries and fish stocks including restoration of same at the Owenbolishka River catchment.***
- ***Additional information on potential peat impacts***
- ***Additional information on potential transboundary impacts***

Additional mitigation measures including:

Section 8.3 Assessment of Environmental Impacts

- ***Additional detail required for EIA;***
- ***listing of additional biodiversity legislation,***
- ***additional requirement for yearly bird monitoring as appropriate,***
- ***additional monitoring requirements,***
- ***specific reference to the Lesser Horseshoe Bat***
- ***notifiable actions in NHAs concerning peat removal or excavation***
- ***further detail on buffer areas and consultation***
- ***surface water management plans and peat depth surveys requirements***

In addition, Material Amendments were proposed by elected members in the July 2011 Council meeting. These were also assessed against the Strategic Environmental Objectives (SEOs), and recommended for adoption or rejection from the SEA and HDA perspective. Thereafter a second consultation period was undertaken and the WES was adopted at the Galway County Council meeting in September 2011.
Annex B of this SEA ER details the proposed amendments, their environmental assessment and mitigation measures as appropriate.

Baseline Data

Baseline data is essential to establish the current state of the environment and helps to identify, evaluate, and monitor the effects of a plan. Baseline data was collected from current sources for each environmental parameter identified in the SEA Regulations. A Geographic Information System (GIS) was established to map environmental opportunities and constraints associated with this study. In addition, Galway County Council has undertaken a considerable amount of GIS analysis in the preparation of the WES and all datasets were provided to the consultants and integrated into one master dataset. ***The Baseline Figures presented in Chapter Four of this ER have been revised to show the adopted Wind Energy Strategy Areas***.

These are detailed below:

2.6 Environmental Issues collated and analysed using GIS.

Biodiversity, Flora and Fauna: All current natural heritage designations provided under European and national legislation were incorporated into the GIS. These include cSpecial Areas of Conservation (cSAC), Special Protection Areas (SPA), and Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs).
The following additional habitat data from Galway County Council was also inputted to the GIS:

- National Parks and Nature Reserves
- Ramsar Sites and Freshwater Pearl Mussel Sub-Catchments
- Limestone Pavement in County Galway, based on available GIS data
- Ecological Network in County Galway, as identified in GCDP 2009-2015
- IPCC database on non designated peatland habitats (source: Irish Peatland Conservation Council)

A HDA is being carried out in tandem with this SEA to address potential impacts on Natura 2000 sites (cSACs and SPAs).

Water (surface, ground, estuarine and coastal*);* County wide river water quality data, drinking water (surface, groundwater abstraction points and public drinking water remedial lists) within draft strategic and acceptable in principle areas; groundwater vulnerability within 5km of draft Strategic/Acceptable in Principle areas and River Catchment data were mapped using data from the EPA. Water Framework Directive Protected Areas were also mapped. EPA data on bathing water, and estuarine and coastal water quality in addition to shellfish waters were also integrated to the GIS.

Soil and Geology: Bedrock geology and drift /quaternary geology data was incorporated into the GIS. Where known, peat depths were also mapped.
In addition, historical landslide data from the Geological Survey of Ireland was inputted. Finally, proposed Geological NHAs were mapped for sites within and 5km from the strategic and acceptable in principle areas.

Landscape: Landscape policies and designations in the County Galway Development Plan 2009 to 2015 were incorporated into the GIS. These include landscape designations and classifications such as special or unique landscapes. In addition, the County Galway Landscape Character Assessment was integrated to the GIS. Neighbouring counties designations such as scenic routes, or areas of primary amenity were also integrated, this data covered the counties of Clare, Offaly, Mayo, Roscommon and Offaly (upto a 50km buffer from Galway County boundaries).

Cultural Heritage (architectural and archaeological heritage): All sites in the recorded sites and monument record were mapped, and all sites within 5km of the strategic and acceptable in principle areas were mapped. All Architectural Conservation Areas within 5km of the strategic and acceptable in principle areas were mapped. Protected structures from the current CDP were mapped for 5km within Strategic/Acceptable in Principle areas.

Population: The existing urban and rural settlements, growth areas and residential properties were mapped as part of the GIS. The An Post GeoDirectory was utilised by GCC to map all residential properties currently receiving post in County Galway. The settlements were identified based on the Settlement Strategy for County Galway as set out under the GCDP. This includes the Galway Metropolitan Area Gateway (including Galway City, Garraun/ Ardaun, Briarhill, Oranmore, Bearna Baile Chláir and Maigh Cuilinn), Tuam Hub Town, the Service Hubs (including Ballinasloe, Clifden, Loughrea, Oughterard, Athenry, Headford, Gort and Portumna), the Local Service Centres and the Small Settlements.
Additional data relating to population were taken from the CDP and RPGs where relevant.

Human health: no direct information was mapped for human health.

Air: sites with Integrated Pollution Prevention and Control licenses were mapped within the area**.** The air quality zones relevant for 5km around each strategic and acceptable in principle area were also mapped.

Climatic factors: no climatic data was mapped**.**

Material assets: key transport routes were mapped. Wastewater treatment plants and flood risk zones were mapped. In addition, Coillte Forestry Management Units were mapped and assessed for strategic and acceptable in principle areas where relevant.

2.7 GIS for identifying potential wind energy areas

Further information is provided in the draft WES in relation to this, but a summary of the data used is provided below:

Planning Permissions and Gate 3 Assignments

The existing wind farms and planning permissions for additional wind farms in County Galway were mapped in the GIS. This data was then correlated with the Gate 3 Node Assignments in County Galway to identify additional areas where further planning applications are likely to arise in the short to medium term.

Wind Resources

A primary consideration is the wind resources available for wind farm developments. The SEI *Wind Atlas 2003* was utilised to extract data on average annual wind speeds for Galway. The *Wind Atlas* provides information on wind speeds modelled at 50m, 75m and 100m. For the purposes of this WES, 75m turbine heights were utilised in the GIS as this reflects the lower turbine heights for commercial wind operators. The areas considered economically viable accordingly have wind speeds of 8m/sec or more at 75m height above ground level and these have accordingly been analysed as part of the GIS.

Based on the SEI *Wind Atlas 2003*, it is apparent that, with the exception of the more elevated parts of the Slieve Aughty Mountain Range and areas to the north, the eastern half of the County has significantly more limited wind speed resources than the western half of the County. The average wind speed over the majority of the eastern half of Galway is shown as 7-8m/s at a height of 75m above ground level.

Transmission Network

A second key consideration in identifying areas for wind farm development relates to access and proximity to the electricity transmission network. Proximity to transmission lines and ability to connect into these lines is a significant consideration for the siting of commercial wind farms. As a general rule, the larger wind energy developments need to access the larger powerlines such as the 400kV or 220kV lines. Smaller wind energy developments can access into the smaller capacity network such as 110kV or 38kV. However, various technical considerations will also affect access to the transmission network.

Galway faces considerable challenges in terms of capturing, storing and transmitting wind energy into the national grid given that the greatest wind energy resources are concentrated in the west of the County where the transmission infrastructure is most limited and also due to the difficulties associated with storing wind energy. County Galway is fortunate, however, in that a new 110kV transmission line has recently been

approved to Screeb that will significantly improve the electricity infrastructure in the west of the County.

The east of the County has greater infrastructural capacity associated with the larger transmission lines already in the County. Future improvements in the transmission network in the County would allow for greater wind penetration into the grid from the abundant wind resources available, particularly in the west of the County.

The transmission network has been mapped as part of the GIS. Almost the entire County is located within 15km of electricity power lines and therefore has strategic potential to connect into the grid, although the capacity of the network and technical, physical, environmental or landscape constraints may limit opportunities for connection, particularly in the west and northwest of the County. There are also some areas in the west of the County that are potentially suitable for wind farm development but which are isolated from the transmission network by intervening areas comprised of large Natura 2000 site/s.

2.9 Consideration of Alternatives

A number of alternative scenarios were considered in updating the Wind Energy Strategy and these are briefly discussed below. *Chapter Six, Consideration of Alternatives* presents this information in more detail.

Option 1 – Do Nothing Scenario

This option would involve retaining the existing wind farm zonings in the GCDP to guide planning of wind farm developments in the County. The existing zonings do not adequately reflect EU and national legislation, technological changes, policy changes and updated planning guidelines for wind farm development that are now available. Particularly in light of the proposed timeframe of this WES, the current strategy of the GCDP 2009-2015 does not adequately reflect recent legislation and policy.

Option 2 – Ad-hoc Planning for Wind Farm Development

This option would result in wind energy applications being addressed on a case-by-case basis without an overall strategic framework to guide wind energy development in County Galway. This is not in line with existing planning guidance for wind energy development and would not facilitate an evaluation of cumulative impacts associating with wind farm development. In addition, the lack of a strategic evaluation of this land use would not be in keeping with the SEA Directive.

Option 3 – Alternative Renewable Energy Sources

This option would involve planning for alternative renewable energy sources such as biomass or tidal power in seeking to achieve a target that reflects the national target of 40% renewable energy production by 2020. Whilst other renewable energies can and will contribute to this target, in practice County Galway has a significant wind resource and at national level Ireland has experience in planning and managing this technology. Wind energy technology is currently the most established and experienced renewable technology in this country hence the focus for the lifetime of this strategy (2011 to 2020) remains on wind energy planning.

Option 4 – Offshore Wind Energy Development

This scenario would see the direction of wind farms to the offshore areas of County Galway as a means of achieving renewable energy targets. It is unlikely that the County could achieve significant renewable energy production from this offshore wind energy development within the timeframe envisaged for the WES. In addition, Sustainable Energy Agency Ireland (SEAI) have recently issued a draft SEA for offshore renewable energy production around Ireland, so this will assist in directing renewable energy production including offshore wind farms to appropriate sites. Once finalised, should recommendations arise from this study that concern renewable energy in the County, these will be considered by GCC. Thus, while this option was not considered a realistic alternative to onshore wind energy development, it has been considered as part of the overall WES for County Galway.

Option 5 – Onshore and Offshore Wind Energy Development

This scenario would direct wind energy developments to both on shore and offshore areas in and around County Galway as a means of achieving renewable energy targets. It is unlikely that the County could achieve significant renewable energy production from off shore wind energy within the timeframe envisaged for this WES, however, there may be potential for a certain amount of off shore wind energy development and the WES has accordingly retained the flexibility to allow for offshore wind farm developments.

Option 6 – Alternative Targets and Alternative Timeframes

This scenario would assess different renewable energy targets and timeframes as a means of achieving a 2020 renewable energy target of 40% electricity production from renewable energy resources. .

Option 7 – Strategic Approach to Wind Energy Development

This approach recognises where the principal wind resources are and matches them to existing infrastructure – two critical considerations for wind energy development. In addition, the identification of Strategic Areas and Acceptable in Principle Areas permits a comprehensive assessment of environmental resources within and close to these areas, facilitating a more robust SEA and HDA process that informs the WES development. It allows for a medium term view of wind energy developments in the County and encourages clustering or sharing of infrastructure associated with wind energy development such as access roads.

Options 7a to 7e – these were a range of spatial options that are essentially sub options of number 7. These are discussed in more detail in *Chapter Six, Alternatives.*

In addition, other areas were considered for designation within the strategy but were excluded for a number of reasons. Further detail is presented in the *Chapter Six*, *Alternatives* of this report.

2.10 Environmental Assessment of the County Galway Wind Energy Strategy

The likely significant effects on the environment are described in this Environmental Report and measures are identified to avoid, reduce or mitigate any significant effects of the Strategy. A framework of objectives has been developed to assess the potential impacts of the actions and policies proposed in the Strategy. The results of this process are summarized in a table called an evaluation matrix. This matrix sets out the environmental objectives, with indicators and columns for undertaking the appraisal of potential impacts on each parameter listed in the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (SI 436 and S.I 435 of 2004) The potential effects within the assessment were categorized, as per the Guidelines, into the following broad environmental impacts:

_ Positive impact
_ Indirectly positive impact
_ Neutral impact
_ Negative impact
_ Indirectly negative impact
_ Uncertain nature of impact.

In addition, the temporal aspect of each impact is considered under the following:

- Short term effects
- Medium term effects
- Long term effects
- Permanent effects
- Temporary effects
- Secondary effects
- Cumulative effects
- Synergistic effects
- Positive effects
- Negative effects

The Impact table is accompanied by more detailed and explanatory text that discusses the level of significance, temporal and type of impacts identified. This is presented in *Chapter Seven, Likely Significant Environmental Effects of WES.*

2.11 Technical Difficulties Encountered

A considerable amount of data was utilised in preparing this Environmental Report. However, there are a number of areas where data is not available and therefore recommendations arise to find out this type of information at project level. Key technical difficulties encountered include:

- Landslide susceptibility mapping – this is not available for County Galway and required datasets to develop such a model are not currently available.
- Additional habitat information for certain parts of County Galway are not yet available, all other available ecological data has been incorporated
- Information on certain bird movements`
- Corine landcover information. The 2000 dataset had to be used although a more recent Corine survey was undertaken in 2006, however this is not yet publicly available.
- Detailed information on health problems and issues in the county is not available

There exist considerable variations in county level environmental information. Whilst certain information is readily and easily accessible, such as data relating to water quality;

other information is more difficult to ascertain or is not yet available, such as landslide susceptibility mapping. Nonetheless, the GIS established for this SEA should assist in identifying data gaps and as information becomes more available at local level, it is recommended that such data be integrated into the GIS where possible.

3 Chapter Three: Relationships to Key Plans, Policies and Programmes.

3.1 Introduction

The Draft WES is situated within a hierarchy of international, national, regional, and county level policy guidelines. In addition, there is an overarching legislative framework which provides the statutory basis for designations and objectives. This chapter of the Environmental Report reviews the consistency of the Draft WES within this policy and regulatory framework.

Table 3a below sets out the main plans, policies, programmes and directives identified and gives a brief summary of their main objectives.

Table 3a: International Policy and Regulatory Context

EU LEVEL	
Direction/ Plan/ Programme	**Summary of Objectives**
Kyoto Protocol	This international agreement is linked to the United Nations Framework Convention on Climate Change and sets binding targets of 37 industrialized countries and the European Community. The National Climate Change Strategy sets out how Ireland is participating in this process.
Directive 2009/28/EC	On the promotion of use of energy from renewable sources established 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 a binding renewable energy target across heat, transport and electricity sectors. Ireland overall target is to achieve 20% of energy from renewable sources by 2020.
EU Sixth Environmental Action Programme (1998)	The Environment Action Programme takes a broad look at the challenges of environmental policy and provides a strategic framework for the Commission's environmental policy up to 2012. It identifies four environmental areas for priority actions: Climate Change Nature and Biodiversity Environment and Health and Quality of Life Natural Resources and Waste It calls for the development of Seven Thematic Strategies relevant to the various environmental areas. These strategies constitute the framework for action at EU level in each of the concerned priorities. It also establishes strategic approaches to meet the environmental goals and sets objectives and priority actions on international issues.
Biodiversity	
European Biodiversity	The strategy aims to anticipate, prevent and attack the causes of

Strategy (1998)	significant reduction or loss of biodiversity at the source.
UN Convention of Biological Diversity 1992 ratified 1996	objectives of this Convention were to conserve biological species, genetic resources, habitats and ecosystems; to ensure the sustainable use of biological materials; and to guarantee the fair and equitable sharing of benefits derived from genetic resources.
Convention on Wetlands of International Importance (Ramsar Convention 1971)	An intergovernmental treaty, which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. Each Member State must recognise and preserve internationally important wetlands. Ireland has designated 45 wetlands for inclusion in the Ramsar List of Wetlands of International Importance, the majority of which are owned by the State.
EU Habitats Directive 92/43/EEC	A scheme of protection of particular animals and plant species, as well as a selection of habitat. It provides for a network of protected sites known as Natura 2000. Specific protections for the sites, will limit the extent and nature of development, which may have a detrimental effect on the flora or fauna identified therein. Protects over 1000 animals and plant species and over 200 'habitat types' which are of European importance It is transposed into Irish law by The European Communities (Natural Habitats) Regulations, 1997 (S.I. 94 of 1997).
Birds Directive (79/409/EEC)	Provides a common framework for the conservation of naturally occurring species of wild birds and their habitats throughout the EU as listed under the Directive's Annex 1. The most suitable areas for these species are classified as Special Protection Areas (SPA). Ireland is obliged to "take appropriate steps to avoid pollution or deterioration of habitats or any disturbances affecting the birds".
Wind Energy Development and Natura 2000 sites	European Commission Guidance on wind energy and natura 2000 sites; this guidance reviews Habitats Directive Assessments, SEA and EIA and provides information on key impacts, mitigation measures and case studies from the EU.
EU Freshwater Fish Directive 1978	The aim of the Directive is to protect fish life from pollution discharge into waters and lays out water sampling and monitoring procedures and definitions. The EU Freshwater Fish Directive (78/659/EEC) was ratified by Ireland with S.I. 293 of 1988, and aims to protect those fresh water bodies identified by Member States as waters suitable for sustaining fish populations. The Directive will be repealed in 2013 by the EU Water Framework Directive.
UN Convention of Biological Diversity 1992	The purpose of this Convention is to conserve biological species, genetic resources, habitats and ecosystems, to ensure the sustainable use of biological materials, and to guarantee a sustainable sharing of benefits derived from genetic resources. In April 2002, the Parties to the Convention committed themselves to achieve, by 2010, a significant reduction of the current rate of biodiversity loss at global, regional and national levels.
OSPAR Convention 1992	To encourage international cooperation to protect the marine environment of the North-East Atlantic. It is required to take steps to prevent and eliminate marine pollution and to protect the maritime area, thereby safeguarding human health and conserving marine ecosystems. Where practicable, damaged marine areas are to be restored. Both the precautionary

	principle and polluter pays principle are to apply. All possible steps are to be taken to prevent and eliminate pollution from land-based sources, with joint assessments of the quality of the marine environment being undertaken by party states.
Water	
E.U. Water Framework Directive 2000 Council Directive 2000/60/EC was adopted in 2000	Aimed at improving the water environment, requiring member governments to take a holistic approach to managing their waters. Member states must aim to achieve good status in all waters by 2015 and must ensure that status does not deteriorate in any waters.
Floods Directive 2007/60/EC	The EU Floods Directive on the assessment and management of flood risks entered into force on November 2007. This Directive now requires Member States to assess if all water courses and coast lines are at risk from flooding, to map the flood extent and assets and humans at risk in these areas and to take adequate and coordinated measures to reduce this flood risk. With this Directive also reinforces the rights of the public to access this information and to have a say in the planning process.
Groundwater Directive 80/68/EEC	Developed in response to Article 17 of the Water Framework Directive. It requires Member States to apply a system of investigation and authorisation to waste disposal and other activities in order to ensure that groundwater is not polluted by dangerous substances.
Surface Water Directive 75/440/EEC	The Directive aims to protect public health by ensuring that surface water abstracted for use as drinking water reaches certain quality standards before it is supplied to the public. The Directive lays down nonbinding 'guide' values and binding 'imperative' values and requires Member States to monitor the quality of surface waters from which drinking water is abstracted and to take measures to ensure that it complies with the minimum quality standards. This Directive has been integrated into the proposed Water Framework Directive.
Quality of Drinking Water Directive (98/83/EC)	The objective is to protect the health of the consumers of the EU and to make sure the water is wholesome and clean. It sets quality standards for drinking water quality at tap. Obliges Member States to monitor drinking water quality and provide consumer with adequate and up-to-date information on their drinking water quality.
Integrated Pollution Prevention and Control (IPPC) Licensing	A system of Integrated Pollution Prevention and Control (IPPC) licensing came into effect in Ireland on 12th July 2004. The primary aims of IPPC licensing are to prevent or reduce emissions to air, water and land, to reduce waste and to use energy efficiently. The IPPC system replaces Integrated Pollution Control (IPC) as the licensing regime applicable to certain industrial activities in Ireland.
Bathing Water Directive (76/160/EEC) S.I. 155 of 1992, S.I. 230 of 1996	Directive 76/160/EEC concerns the quality of bathing water, with the exception of water intended for therapeutic purposes and water used in swimming pools. It lays down the minimum quality criteria to be met for bathing waters.
Natural and Cultural Heritage	
UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage	It covers not only monuments, groups of buildings and sites which have outstanding universal value but also natural sites of major importance. Parties are required to identify these locations and to ensure that they are protected and conserved for future

	generations.
European Convention on the Protection of the Archaeological Heritage, 1992 (Revised) (the 'Valletta Convention')	Ratified by Ireland in 1997 and as such we are legally bound by it. The aim of the Convention is to 'protect the archaeological heritage as a source of the European collective memory and as an instrument for historical and scientific study'. It requires that appropriate consideration be given to archaeological issues at all stages of the planning and development process.
Granada Convention for the Protection of the Architectural Heritage of Europe 1985	This was ratified by Ireland in 1985 and establishes common principles and strategy, which have informed Part IV of the 2000 Planning and Development Act 2000-2004.
Landscape	
European Landscape Convention 2000	Ratified by Ireland in 2002, it requires a commitment to introducing policies to effect landscape protection and management. The underlying purpose of the Convention is to encourage public authorities to adopt policies and measures at local, regional, national and international level to protect and manage landscapes throughout Europe. It requires the landscape dimension to feature in a country's spatial planning and environmental policies and for landscape quality objectives to be developed.
EU Directive 2002/49/EC(the noise directive transposed into Environmental Noise regulations 2006 S.I. 140 of	The directive requires that action is taken under each member state with a view to preventing or reducing environmental noise where necessary and particularly where exposure levels can induce harmful effects on human health and to preserving environmental acoustic quality where it is identified as being of good quality.
Urban Wastewater Treatment Directive (91/271/EEC)	Aimed at protecting the environment from the adverse effects of urban wastewater discharges and discharges from certain industrial sectors. The Directive is transposed into Irish law mainly by the Urban Waste Water Treatment Regulations 2001 (S.I. No. 254 of 2001).
Waste	
The Waste Framework Directive 75/442/EEC (and amending legislation) 15th July 1975	This Directive outlines the overall structure for an effective waste management regime within the EU. It mandates that EU States publish waste management plans. It requires 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 Urban Waste Water Treatment Directive (91/271/EEC) 1991 and Landfill Directive relate to this.
Landfill Directive (1999/31/EC)	Besides setting EU-wide standards for landfill design and operation, the Council Directive on Landfill mandates a series of targets to cause a substantial reduction of the land filling of biodegradable municipal waste by EU countries. Using the amount of waste landfilled by each EU state in 1995 as a baseline, it requires that biodegradable waste passing to landfill sites is reduced progressively to 35% of the 1995 level over a period of some 15 years. A national strategy is required to be published by each EU Member State on how this is to be achieved.
Dangerous Substances	
COMAH (Seveso II) Directive	The Seveso II Directive, sometimes referred to as COMAH,

– European Communities (Control of Major Accident Hazards involving Dangerous Substances) Regulations, 2000.	stipulates certain requirements for storage of relatively large quantities of substances classified as dangerous.
EU Major Accident (Seveso II) Directive (96/82/EC) 1996	This Directive aims to prevent major-accident hazards involving dangerous substances. Hazardous sites are identified that may pose a threat and development should be limited in the vicinity of such sites. The control of establishments for the purposes of reducing the risk, or limiting the consequences, of a major accident is a mandatory objective of a Development Plan.
Dangerous Substances Directive 76/464/EEC (S.I. 258 of 1998, S.I. 12 of 2001)	Dangerous Substances Directive 76/464/EEC creates a legislative framework for dealing with water pollution caused by an extensive list of dangerous substances. Member States are required to adopt pollution-reduction programmes that involve binding water quality objectives and a system of authorisations for discharges.
SEA	
Protocol on Strategic Environmental Assessment (SEA)	It develops from the ESPOO Convention by requiring Parties to evaluate the environmental and health related consequences of their official draft plans and programmes using Strategic Environmental Assessment (SEA). It was signed by Ireland in 2003.
SEA – Directive 2001/42/EC Assessment of the effects of certain plans and programmes on the Environment.	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. There are two statutory instruments which transposed the SEA Directive into Irish Law: -European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004, S.I. No. 435 of 2004 - Planning and Development (Strategic Environmental Assessment) Regulations 2004, S.I. No. 436 of 2004.
EIA	
ESPOO Convention	The Convention on Environmental Impact Assessment in an international Transboundary Context is also known as ESPOO (EIA) Convention. It requires Parties/ states to put in place appropriate and effective measures to prevent, reduce and control significant adverse transboundary environmental impacts from proposed industrial and other activities. Systems is to ensure that specified projects which may cause significant adverse transboundary impacts are subject to environmental impact assessment (EIA) prior to any formal approval being granted on their commencement.
Environmental Impact Assessment Directive 85/337/EEC (as amended by Directive 97/11/EC)	It requires Member States to carry out environmental impact assessments (EIA) on certain public and private projects, before they are authorised, where it is believed that the projects are likely to have a significant impact on the environment.

1.1.2 National Context

The policies and proposals contained in the Draft WES are further influenced by the objectives of relevant National policies, plans and guidelines. ***Table 3b*** identifies these at National level and gives a brief summary of their main objectives.

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Table 3b: National Regulatory and Policy Context

National Level	
Plan/ Programme/ Guidelines	**Summary of Objectives**
Sustainable Development	
Sustainable Development: A Strategy for Ireland (1997)	This Strategy recognises the need for good spatial planning and the inclusion of sustainability goals in urban and built environment policies.
Making Ireland Sustainable: Sustainable Development 2002	This reviews progress in Ireland since the Earth Summit in Rio. It outlines priorities for sustainable development action over the following decade.
Health Impact Assessment Guidance, Institute of Public Health, 2009	Seeks to inform and enhance the decision making process in favour of health and health equity. It provides a detailed methodology for completing HIA on plans, programmes or policies, in order to maximise positive health impacts and minimise potential negative impacts of a proposal.
Spatial Development	
National Spatial Strategy 2002-2020	A 20-year national planning framework to achieve more balanced social, economic and physical development across Ireland. The strategic guidance document is based in concentrating development to key areas across the country. The NSS supports economic growth and diversification across the west, including economies based on sustainable use of natural resources such as scenic landscapes for tourism, fisheries and marine based aquaculture, forestry and renewable energy.
National Development Plan (NDP) (2007-2013)	A €184 million infrastructure investment plan to build a prosperous country for Ireland's population. The funding is to provide for economic and social infrastructure, employment and human resources, productive sector as well as the peace programme.
The Planning and Development Act 2000 (as amended)	Under the Planning Acts, each Local Authority has a responsibility to determine policy in its area through the making of a Development Plan and for applying that policy, through planning control, in deciding on planning applications and enforcing planning.
Development Management Guidelines (DoEHLG)	These guidelines are of relevance to all types of planning applications, as well as applicants and their advisers, on the operation of the planning process. They are also intended to promote best practices within planning authorities.
Climate Change and Energy	
National Climate Change Strategy 2007 -2012	The purpose is to limit growth in greenhouse gas emissions. This strategy sets out how to achieve the targers from the Kyoto Protocal and identiy areas where further research and develop is needed to meet out 2020 commitment. Measures include increasing renewable energy production and using energy more efficiently.

Delivering a sustainable energy future for Ireland – the Energy Policy Framework 2007 -2020	This sets out energy policy for Ireland and states the commitment to increasing renewable energy
Building Ireland's Smart Economy	Sets out the strategic approach to building a smart economy including renewable energy production
National Renewable Energy Action Plan	This sets out measures on how Ireland will meet the 20% renewable energy target for 2020
Draft Offshore Renewable Energy Development Plan 2010	The Sustainable Energy Agency of Ireland has published the Draft Offshore Renewable Energy Development Plan which has provided greater information relating to offshore renewable energy production, including fixed offshore wind farms. County Galway lies within the West Region (Assessment Area 5) where offshore wind and tidal have been identified as having potential. In turn, the level and significance of impacts for offshore wind depends on the scale of development, the accompanying SEA to the OREDP assesses impacts as negligible up to 300 MW, whilst more serious impacts are identified above this threshold.
Grid 25	Is a strategy for the development of Ireland's grid network. Galway lies within the Northwest Region – an area identified as having the largest expected regional distribution of renewable energy capacity, however upgrading the system in this region is considered imperative.
Wind Energy Development Guidelines - Guidelines for Planning Authorities (DoEHLG, 2006)	The guidelines intend to ensure a consistency of approach throughout the country in the identification of suitable locations for wind energy development and the treatment of planning applications for wind energy developments. There are no wind energy locations identified in Limerick CDP.
The Planning System and Flood Risk Management Guidelines 2009	Aims to integrate flood risk management into the planning process
Noise	
Noise Regulations 1994	These regulations, relating to the 1992 EPA Act, simplify and strengthen the procedures for dealing with noise nuisance, and give Local Authorities power to take action when they consider that it is necessary to do so in order to prevent or limit noise.
Communications	
Guidelines on Telecommunication Antennas and Support Structures, 1996	The Guidelines are intended to assist planning authorities in balancing the need for the comprehensive national provision of telecommunications services against local environmental and public health-related concerns.
Waste	
Changing Our Ways (1998)	Sets out a national policy framework for the adoption and implementation by local authorities of their waste management plans. It reiterates the targets for the progressive reduction of the use of landfill for biodegradable municipal waste which are set down in the EU Landfill Directive, but adds further national targets such as for the reclamation of construction and demolition waste.
National Strategy for Biodegradable Waste, 2006	An aim is to set out how the three progressive landfill diversion targets of the Directive are to have effect. It states that a major increase in recycling and biological treatment capacity is necessary in order to facilitate the EU requirement for the

	diversion of biodegradable municipal waste away from landfill.
Biodiversity	
National Biodiversity Plan (2002)	It aims to secure the conservation, including where possible the enhancement and sustainable use, of biological diversity in Ireland and to contribute to conservation and sustainable use of biodiversity globally. Ireland is committed to meeting the EU target to halt the loss of biodiversity by 2010.
National Heritage Plan (2002)	The National Heritage Plan 2002 sets out a vision for the management of the National Heritage and its aim is to "*ensure the protection of our Heritage and to promote its enjoyment by all*". A key objective of the National Heritage Plan is to promote the role that local communities play in protecting and enhancing Local Heritage. This is achieved through the preparation and adoption of Local Heritage Plans by the Local Authority.
Biodiversity Action Plan, EPA, 2010	The EPA's Biodiversity Action Plan presents an explicit action plan for the implementation of its role in the protection of biodiversity. The Plan covers a range of activities in the areas of monitoring, research, assessment and reporting, environmental regulation, climate change and management and communications. The Plan outlines a wide range of significant actions, which will be undertaken by the EPA in relation to the protection of Ireland's biodiversity.
Air Pollution Act, 1987	This Act defines air pollution and enables Local Authorities to require measures to be taken to prevent or limit pollution.
Water	
Water Services Act 2007	Focuses on management of water 'in the pipe' as opposed to river water quality etc
Local Government (Water Pollution) Acts, 1977 and 1990	This Act and associated regulations set out quality standards for Phosphorus in surface waters, particularly rivers and lakes and makes other provisions for the protection of watercourses.
Water Quality (Dangerous Substances) Regulations 2001.	These Regulations give effect to the Dangerous Substances Directive 76/464/EC and the Water Framework Directive 2000/60/EC. They prescribe water quality standards and aim to ensure that, in relation to a substance present, where the existing condition of a water body does not meet a specific standard there shall be no further reduction in the condition of the water body.
Water Services Investment Programme 2007-2014	As part of the programme the Council has identified the resources needed to upgrade the City's existing water main infrastructure to ensure issues such as leakage and reduced pressure are addressed as a priority.
The Planning System and Flood Risk Management Guidelines 2009	These guidelines are aimed at ensuring a more consistent, rigorous and systematic approach to fully incorporate flood risk assessment and management into the planning system.
Western River Basin District Management Plan and Shannon International River Basin District	Sets out assessment and measures to ensure compliance with Water Framework Directive by 2015. County Galway includes two areas, West, which is west of Lough Corrib and Shannon which is in the east of the County.
Cultural Heritage	
Architectural Heritage Protection 2004-Guideines for Planning Authorities	These guidelines provide relevant guidance in the context of Part IV of the Planning and Development Act 2000.
Framework and Principles for the	Sets out archaeological policies and principles that should be

protection of the archaeological heritage 1999	applied by all bodies when undertaking or authorizing development.
Landscape	
Landscape and Landscape Assessment Guidelines 2000	A Landscape Character Assessment allows for a proactive approach to landscape management. It aids 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.
Appropriate Assessment of Plans and Projects in Ireland, Guidance for Planning authorities 2009	These guidelines give advice relating to the implementation of Article 6 of the EU Habitats Directive in relation to plans and projects.
Strategic Environmental Assessment	The Planning and Development (Strategic Environmental Assessment) Regulations 2004 (SI 436 2004) Article 13K (1) states that: '*Where a planning authority proposes to make a variation of a development plan under section 13 of the Act, it shall, before giving notice under section 13(2) of the Act, consider whether or not the proposed variation would be likely to have significant effects on the environment, taking into account of relevant criteria set out in Schedule 2A'*

1.1.3 Regional Context

The policies and proposals contained in the Draft WES are further influenced by the objectives of relevant regional policies, plans and guidelines. *Table* 3c identifies and gives a brief summary of their main objectives.

Table 3c Regional Plans and Programmes

Regional Planning Guidelines for the West Region 2010 to 2022	These guidelines set out a framework for the long term strategic development of counties Galway, Mayo and Roscommon. In relation to energy provision, upgrading the energy supply and network and support of renewable energy are identified as two key investment priorities required to support the sustainable development of the West Region. The renewable energy potential is identified as a key opportunity for this region. A number of policies and objectives support renewable energy in appropriate locations, upgrading of energy network and economic and social benefits for community as whole relating to renewable energy projects. Wind and wood renewable are identified as key potential energy sources in the short term.
Western River Basin District Management Plan 2009 -2015	And associated programme of measures. This aims to protect all waters within the district and improve waters and achieve sustainable water use. Water management unit action plans are developed for smaller geographical areas within this river basin district.
Replacement Waste Management Plan for the Connaught Region 2006-2011	A regional approach to integrated waste management based on the waste hierarch established by the EU Framework Directive on Waste. Targets to be achieved by 2013 relate to

	48% recycling, 33% energy recovery and 19% residual waste disposal. It covers Galway City, Counties Galway, Leitrim, Mayo, Roscommon and Sligo
Development Plans and Wind Energy Strategies for Neighbouring Local Authorities	
County Mayo Wind Energy Strategy	Is included as part of the County Mayo Development Plan 2008-2014; it identifies areas as acceptable in principle, open to consideration and not normally permissible. Eastern parts of the county are identified for wind energy development. More recently (2011) Mayo CC has issued for public consultation a Renewable Energy Strategy that identifies areas of on shore and offshore wind, geothermal and biomass. This is currently going through revisions following the public consultation period and is subject to SEA and HDA
County Roscommon Wind Energy Strategy in preparation	The draft Strategy is again under preparation, and has identified wind energy areas as most favoured, less favoured and areas not favoured. The most favoured areas are spread fairly evenly with parts of the west, south and east of the county identified under this designation.
County Offaly Wind Energy Strategy	Areas suitable for wind energy developments; two areas are identified, a large area in the eastern part of the county, and a smaller area west of Shannonbridge. This strategy is included in the Offaly County Development Plan 2009 -2015
North Tipperary Wind Energy Strategy	Climate Change policies are provided in the North Tipperary CDP 2010 -2016 and advice identifying wind energy areas based on landscape capacity are found in the Wind Capacity Strategy.
County Clare Wind Energy Strategy	This strategy identifies principally strategic and acceptable in principle areas. The strategic areas are identified for the area around Sliabh Callan in West Clare and the Broadford Hills in East Clare. This WES was subject to a SEA and HDA. This WES has been brought into the recently adopted County Clare CDP 2011-2017

The preparation of the WES has had regard to local, regional, national, EU and international agreements, policy and legislation in relation to climate change, energy security and renewable energy.

4 Chapter Four: Environmental Baseline

4.1 Introduction

This SEA of the WES includes a description of the relevant aspects of the current state of the environment, the existing environmental problems, environmental characteristics of the areas likely to be significantly affected, and the likely evolution without implementation of the WES. This section aims to describe the environmental context within which the WES will operate and the constraints and targets that this context imposes on the strategy. Finally, any significant gaps in the baseline data are identified and alternative data sources identified. ***Please note that the figures in this chapter have been revised to reflect the adopted WES designations***.

The purpose of this section is to provide enough environmental baseline data to:

1. Support the identification of environmental problems;
2. Support the process of assessing the environmental effects;
3. Provide a baseline against which future monitoring data can be compared.

The following sections provide information on the environmental parameters below:

- Biodiversity – Flora and Fauna;
- Water – surface, ground, estuarine, coastal
- Soil and Geology
- Population and Human Health
- Landscape.
- Cultural Heritage – archaeology and architectural resources
- Air Quality and Climatic factors
- Material assets
- Interrelationship between these parameters

4.2 Overview of County Environmental Resources and Sensitivities

County Galway has significant environmental resources and a number of particular sensitivities. In developing the Draft Wind Energy Strategy, the whole environment of the County was investigated but key considerations resulted in focusing the process on certain areas. The SEI *Wind Atlas 2003* was utilised to extract data on average annual wind speeds for Galway. The *Wind Atlas* provides information on wind speeds modelled at 50m, 75m and 100m. For the purposes of this WES, 75m turbine heights were utilised in the GIS as this reflects the lower turbine heights for commercial wind operators. The areas considered economically viable accordingly have wind speeds of 8m/sec or more at 75m height above ground level and these have accordingly been analysed as part of the GIS.

Based on the SEI *Wind Atlas 2003*, it is apparent that, with the exception of the more elevated parts of the Slieve Aughty Mountain Range and areas to the north, the eastern half of the County has significantly more limited wind speed resources than the western half of the County. The average wind speed over the majority of the eastern half of Galway is shown as 7-8m/s at a height of 75m above ground level. These areas have not been considered as they are unlikely to be the focus of commercial wind energy

development over the lifetime of this Draft WES. However, where there may be impacts on these areas due to development in wind energy zones close by, the environmental sensitivities are highlighted in this chapter.

4.2.1 Defining the descriptive areas and zones of influence

The Draft WES through zoning and policy will aim to direct wind farm developments to two principal zonings in the County. Therefore, the baseline data is principally focused on the strategic and acceptable in principle areas. The zone of influence of the strategy depends on the environmental parameter described and are detailed within each relevant section. For example, hydrogeological impacts will likely extend beyond the development site, visual impacts may be identified for areas beyond the County Boundaries, whilst impacts on individual archaeological sites may be site specific. Due to the strategic nature of this Draft Wind Strategy, the number of windfarms that may be permitted in these sites cannot be anticipated as this is subject to site specific technical and environmental considerations. However, it can be assumed that in combination the strategic areas and acceptable in principle areas will be subject to Windfarm developments if the strategy is adopted as a Variation of the County Galway Development Plan 2009 -2015.

Information, where relevant, is included from neighboring counties including Galway City, Roscommon, Offaly, Clare, North Tipperary and Mayo. For the purposes of this chapter, the strategic and acceptable in principle sites are grouped into four broad areas and are shown in Figure 4.1

Strategic Area– this includes the townlands and hills of Derrada, Seecan, Buffy and Finnaune

Acceptable in Principle Areas – these are grouped into three areas, named as follows:
Knockbrack – this area lies north and west of the Strategic Area, and in includes townlands of Knockbrack, Knockaphreagaun; this area also include some small areas southeast of the Strategic Area located around Knockalough**.**
Cappaghoosh – the most westerly area this is an area south of Recess and Maam Cross, and includes the townland of Cappahoosh
Lettermucknoo – this area lies south west of the strategic area and includes the townland of Lettermuckoo

A third zoning relates to areas defined as Open for Consideration; applications will be assessed on a case by case basis in these areas. The level of interest in wind farm development in these areas cannot be anticipated. Any particular environmental sensitivities in this area are highlighted in this section.

The baseline has been compiled using available datasets and indicators suggested during scoping and detailed in Chapter Two Methodology.

4.2.2 Biodiversity, Flora and Fauna

County Galway contains a variety of natural habitats including many of international nature importance such as blanket bogs, fens, heath, ancient oak woodland, turloughs,

MAYO

ROSCOMMON

GALWAY

CLARE

TIPPERARY

Cappaghoosh

Knockbrack

Lettermuckoo

Galway

Galway Bay

Inismore

Inismaan

Inisheer

SA - Strategic Areas
AP - Acceptable in Principle
OC - Open to Consideration
NP - Not Normally Permissible Areas

0 5 10 20
Kilometres

DATE: 20/10/11	SCALE: 1:400,000	**FIGURE 4.1: EXISTING STRATEGY**	**minogue & associates** Tuamgraney, County Clare T: 061 640667 **ERA-MAPTEC** 40 Lwr. O'Connell St. Dublin 1 www.era.ie
REF: WES/xx	SIZE: A3	Galway County Council Wind Energy Strategy	
DRAWN: EV	APPROVED: RM		

species-rich calcareous grassland and limestone pavement. The County also contains a large number of rare, threatened and uncommon species, including a large number of plants and animals that are protected under national and European Union legislation. A number of these species are found within the habitats of high value mentioned below as well as within the County's designated ecological sites. The following section outlines the main habitats within the draft WES areas.

4.2.3 Peatlands

Peatlands such as raised and blanket bogs, wet and dry heath, and fens are of particular value because of the rarity of these habitats in an international context, and because of the characteristic flora and fauna that live in these wet, peaty and often highly acidic places. Irish raised bogs account for 50% of all the conservation-worthy raised bogs remaining in Europe. A number of high quality active raised bogs are found in the north and east of County Galway, as well as large areas of cutover and degraded raised bog.

The most extensive habitat of nature importance within County Galway is lowland blanket bog, found mainly in south Connemara. This habitat, which often occurs in close association with nutrient-poor lakes and rivers, provides a habitat for a large number of rare plants including Slender Cotton Grass, Bog Orchid and Pillwort. The mountains of Connemara and other upland areas in the County are generally dominated by upland blanket bog, wet, dry and montane heath.

A number of birds live and breed on bogs including Red Grouse, Golden Plover and the Curlew. These birds are very vulnerable to loss of good quality bog habitat and their numbers have been declining for many years. The coastal areas of Connemara tend to be dominated by extensive areas of dry heath and outcropping bedrock (mostly granite). The shallow, peaty soils found in these coastal heaths provide a habitat for a range of rare plants including Pyramidal Bugle, Pale Dog-violet, Green-winged Orchid and Spotted Rock-rose.

Fens are another important but less abundant peatland type found in Galway, which often occurs in association with raised bogs, eskers and/ or lakes. The Marsh Fritillary is one of the most endangered species in Europe due to the loss of its habitat across much of its range. County Galway contains a large proportion of the Irish population and colonies can be found on a number of fens and raised bog sites in the east of the County. Figure 4.2 shows Corine Landcover plus identified peatlands of interest from the Irish Peatland Conservation Council.

4.2.4 Limestone Pavement

Limestone pavement is not present in the areas proposed for designation as Strategic or Acceptable in Principle, but there are a number of small isolated patches present around Moycullen. These areas of limestone pavement often occur in close association with species-rich calcareous grassland and sometimes support the protected species, Wood Bitter-vetch. Often associated with limestone pavement, orchid-rich calcareous grasslands are another priority habitat.

4.2.5 Native Woodland

Native woodland is a relatively uncommon habitat in County Galway. In west Galway, Derryclare and Ballinahinch in Connemara are important native woodland sites,

composed of Sessile Oak, Rowan and Downy Birch. Mammals associated with woodland include the pine marten and red squirrel. Derryclare is also a statutory nature reserve and further information is provided in subsequent sections.

4.2.6 Coniferous plantations

Such plantations as are associated with a number of draft wind energy areas. Forest Management Plans produced by Coillte are available from 2006 – 2010 and present species mix, biodiversity plans, timber production and highlight particular sensitivities. By a considerable extent, the species composition is Sikta Spruce and Lodgepole Pine and the principle soil type is blanket bog of varying depths, with pockets of arable soil.

4.2.7 Freshwater Habitats

Galway also has an abundance of permanent freshwater lakes, with Lough Corrib the largest lake in the County. The shores of Lough Corrib provide habitat for a number of rare plant species including Irish Lady‟s Tresses, Shrubby Cinquefoil and Alder Buckthorn. Many of the rivers and lakes in County Galway have relatively good water quality. These water bodies support a number of rare and important plant and animal species including important fisheries of salmon and brown trout. The Arctic Char is a very rare fish similar in ecology and appearance to the brown trout. One of the first fish to colonise Ireland after the Ice Age, it is confined to just a few of the cold, deeper lakes including Lough Inagh, Fermoyle Lough and Athry in County Galway. The distances of the Strategic Areas and AP areas to these lakes are as follows:

- Lough Inagh to closest AP is 4.1km, to SA is 25.2km
- Lough Fermoyle to closest AP is 1.5km, to SA is 3.2km
- >Athry to closest AP is 4.7km, to SA is 26.3km

The Fresh Water Pearl Mussel is a critically endangered species due to pollution, habitat destruction and over-fishing. It requires particularly clean, clear and well-oxygenated water to survive and in Galway it is restricted to just a few soft-water sites in the west of the County including the Owenriff River in Oughterard. The presence of Freshwater Pearl Mussels in a river system is indicative of water of the highest quality. The White Clawed Crayfish is protected in Ireland and under EU legislation. It prefers calcareous waters and is found in Lough Corrib, Lough Derg and other rivers of the Shannon catchment. The Irish crayfish population is especially important, as it remains free of a fungal disease that has decimated populations elsewhere in Europe.

Schedule 2 of Wild Salmon and Sea Trout Tagging Scheme Regulations 2009 list names of all nationally important salmon rivers. In Galway Fishery District, this includes the following rivers: Corrib, Aille (Galway), Kilcolgan, Clarinbridge, Knock and Owenboliska R (Spiddal). In Connemara Fishery District, this includes the rivers of Cashla, Screebe, Ballynahinch and L. Na Furnace.

4.2.8 Coastal Habitats

The coastline of County Galway - including its various offshore islands - stretches for over 2,000 km. It is highly indented and supports a diverse range of habitats including rocky and sandy shores, shingle beaches, and saltwater lagoons. Coastal sand dunes and grasslands are important habitats for many species of invertebrates including rare snails, dragonfly and butterfly species. Machair (flat sandy grassland) is a priority habitat found only along the coast of Ireland and Scotland. In Ireland the distribution of machair is limited to the north-west coast, from Galway Bay to Malin Head in Donegal. Many

machair sites have traditionally been used for low intensity mixed-farming, often as commonage land. High quality machair is found at a few sites in Connemara including Dog‟s Bay near Roundstone and Slyne Head. These areas are awash with orchids and other wildflowers during the summer months. South Connemara is home to the best site in the country for another priority habitat under EU legislation, coastal lagoons, including some saline lake lagoons situated on peat. The Foxtail Stonewort, a protected species of algae that grows in highly saline lagoons, has only been recorded at five locations in Ireland, three of which are in Connemara. Salt marshes occur frequently in sheltered locations along the Galway coast. They contain a suite of species able to cope with the saline conditions and often are important habitats for Otters and a wide range of birds.

Ireland also has one of the most species-rich seaweed floras in Europe with many potential „hot-spots‟ of seaweed diversity identified including Galway Bay, the coast of the Burren and Connemara. Of particular interest are the maerl beds found in western parts of the coasts of County Galway. These rare habitats are composed of deep deposits of calcareous red algae which produce the distinctive „coral‟ beaches found around Carraroe. The Atlantic waters off the Galway coast are home to a great diversity of large marine mammals including Bottlenose Dolphins and the Common and Grey Seal. The coast offers a variety of habitats for all manner of sea birds, including the Chough, which breeds on rocky coastal sites, and the Little Tern, which nests on sandy shores.

4.2.9 Ecological Networks and Connectivity

Ecological networks are important in connecting areas of local biodiversity with each other and with nearby designated sites so as to prevent islands of habitat from being isolated entities. They 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 important for the migration, dispersal and genetic exchange of species of flora and fauna particularly for mammals, especially for bats and small birds. They facilitate linkages both between and within designated ecological sites, the non-designated surrounding countryside and the more urban areas of the County. The County is dissected by many rivers and lakes with Lough Corrib, Ireland‟s second largest, lake at its centre. The banks of these aquatic features together with the extensive coastline of the County provide significant connectivity across the County. Hedgerows are a familiar landscape feature in the countryside of the County, particularly east of Lough Corrib. As well as providing food and shelter for insects, birds and other animals, hedgerows also act as important corridors. Typically, older, denser hedges support a greater abundance and diversity of wildlife.

As traditional species-rich grasslands decline, grassy roadside verges and other marginal grasslands act as important habitats and ecological networks for many species of wild flowers and the invertebrates they support. Because of a management regime which is generally of low-intensity, many grassy verges growing along roads contain a great variety of wild flowers. In Connemara, long stretches of grassy verges may contain a great variety of orchid species. Man made structures such as stone walls, bridges and buildings can also be very important for wildlife and provide feeding, hibernating and roosting sites for many species of invertebrates, birds and bats. A diversity of mosses, lichens and other plants are often found on old stone built structures. Figure 4.3 shows the ecological corridors identified in the GCDP 2009 -2015.

MAYO
ROSCOMMON
OFFALY
CLARE
TIPPERARY

Maumtrasna Mountain Complex
Cappaghoosh
Knockbrack
Lettermuckoo
Coolcam Turlough
Croagh... Turlough
Drumbuleaun Bog
Cloonarkin
Carton-Polnaspruca
Pollacappul Bog
Horseleap Cross
Shannon Callows
Gortachalla Lough
Lough Afoor
Cloon Bog
Tiaquin
Callow Lough
Attymon Bog
Cloonascragh Bog
Creganna Marsh
Pollnagarragh Pools
Cloonoo East & West
Balinahistle Fen
Ballydoogan Bog, Loughrea
Kilmore Woodland
Caherawoneen Fen
Slevoir Bay, Gortmore Point, Church Island, Portumna Bridge, Lough Derg
Termon Lough
Lough Alewnaghty

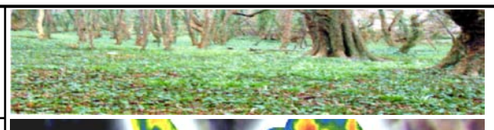
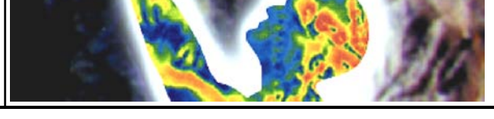
CORINE Land Cover 2006

- Artificial Surfaces
- Airport / Sea Port
- Mineral Extraction Sites
- Sports and Leisure Facilities
- Pasture
- Agricultural Land
- Forestry
- Natural and Semi-Natural Vegetation
- Peatbog
- Wetlands
- Water

Legend

- IPCC Sites
- SA - Strategic Areas
- AP - Acceptable in Principle

0 5 10 20
Kilometres

DATE: 20/10/11	*SCALE: 1:400,000*	**FIGURE 4.2: LANDUSE and IPCC BOGS**	
REF: WES/xx	*SIZE: A3*		
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MAYO

ROSCOMMON

OFFALY

TIPPERARY

CLARE

Mask

Cappaghoosh

Knockbrack

Lettermuckoo

Econet

Class

- 1
- 2
- 3
- 4
- 5
- SA - Strategic Areas
- AP - Acceptable in Principle

0 5 10 20
Kilometres

DATE: 20/10/11	*SCALE: 1:400,000*	**FIGURE 4.3: ECOLOGICAL NETWORK**	**minogue & associates** Tuamgraney, County Clare T: 061 640667 **ERA-MAPTEC** 40 Lwr. O'Connell St. Dublin 1 www.era.ie
REF: WES/xx	*SIZE: A3*	Galway County Council Wind Energy Strategy	
DRAWN: EV	*APPROVED: RM*		

4.2.10 Designated Sites

4.2.11 Natura 2000 Sites

Reflecting the diversity of habitats and species present within the County, there are a significant number of sites designated at international, national and county level. The Habitats Directive Assessment assesses in more detail potential impacts of this draft WES on Natura 2000 sites (Special Areas of Conservation and Special Protection Areas under the EU Habitats Directive). The following table identifies Natura 2000 sites within 5km of the proposed WES areas. This is also shown in Figure 4.4.

Table 4a: Natura 2000 sites within 5km of the draft WES areas.

SACs within 5Km	**Summary**
Strategic Area	
SITECODE	SITE_NAME
000297	Lough Corrib
002034	Connemara Bog Complex
001271	Gortnandarragh Limestone Pavement
001312	Ross Lake And Woods
000297	Lough Corrib
001312	Ross Lake And Woods
001312	Ross Lake And Woods
000297	Lough Corrib
Knockbrack AP	
SITECODE	SITE_NAME
000297	Lough Corrib
002008	Maumturk Mountains
002034	Connemara Bog Complex
002111	Kilkieran Bay And Islands
001312	Ross Lake And Woods
000297	Lough Corrib
000268	Galway Bay Complex
000268	Galway Bay Complex
Lettermuckoo AP	
SITECODE	SITE_NAME
002034	Connemara Bog Complex
002111	Kilkieran Bay And Islands
Cappaghoosh AP	
SITECODE	SITE_NAME
002031	The Twelve Bens/Garraun Complex
002008	Maumturk Mountains
002034	Connemara Bog Complex
002111	Kilkieran Bay And Islands

4.2.12 Natural Heritage Areas and proposed Natural Heritage Areas

The basic designation for wildlife is the Natural Heritage Area (NHA). This is an area considered important for the habitats present or which holds species of plants and animals whose habitat needs protection. NHAs within the county represent a significant biodiversity resource and again, the range of habitats and species found in these sites

vary considerably. All NHAs have been excluded from the strategic/acceptable in principle areas, but some are located close these areas and are the subject of discussion below. *Table 4b* shows the NHAs and proposed NHAs within 5km of the draft Wind Energy areas. Figure 4.5 shows national heritage designations including NHAs, pNHAs, national park and nature reserves.

Table 4b: Natural Heritage Areas and pNHAs within 5km of the Draft WES areas

NHAs within 5 KM		
Strategic Area		
SITECODE	**Oughterard District Bogs NHA**	**Site Summary**
2431	Oughterard District Bog NHA contains a relatively large area of lowland and upland blanket bog extending from Corkernarusheeny in the north to Uggool in the south. It is located to the south-west of Oughterard, Co. Galway. The altitude range is between 80 m and 291 m. Bedrock geology is granite and sandstone, overlain in places by shallow glacial till. The site consists of a number of hills, Clooshgereen, Knocknalee and Luggakeeraunin. In between the hills are stream corridors, flushed areas, lakes and pool systems. Heath is present on the slopes of some of the hills. Current landuse on the site consists of mechanical peat cutting and grazing. Forestry occurs adjacent to the site. Damaging activities associated with these land uses include drainage and periodic burning of the bog. Some areas are heavily grazed by sheep and cattle and are poached and bare. These developments have resulted in loss of habitat and have impacted on the bog's hydrology. They may continue to pose a threat to the site's conservation prospects.	
2364	**Moycullen Bogs NHA**	**Site Summary**
	Moycullen Bogs NHA is an extensive lowland blanket bog located 5 km west of Galway City in Co. Galway. To the west it is largely bounded by the Spiddle - Moycullen Road (some areas west and north-west of this road are, however, included), to the north and east by the Galway - Moycullen road and to the south by the Galway - Spiddle road. It has an altitude range of between 40 m and 143 m and is primarily underlain by granite bedrock. Several lakes and streams are contained in the site as well as large areas of wet and dry heath, fens and flushes and revegetating cutaway. The main habitat on the site is blanket bog, usually dominated by Purple Moor-grass (*Molinia caerulea*), Cross-leaved Heath (*Erica tetralix*) and Ling Heather (*Calluna vulgaris*). The site supports Irish Red Data Book species Red Grouse and several additional notable species of fauna including Irish Hare, Common Frog, Snipe, Curlew, Fox, Kestrel and Lapwing. Peat cutting (both mechanical and hand) is the dominant land use at present, while grazing pressure by donkey, cattle and ponies is low but locally damaging. Sheep appear to be absent. There are a number of quarries within the site – notably at Derrycrih. A golf course has been constructed on the north side of Lough Inch and a small pitch and putt course has been established on the southern shores of the lake. There has been some burning of the bog surface in the recent past and conifer plantations have been planted in the centre and eastern area of the site. Due to the proximity of the site to Galway City there is increasing pressure from housing development (typically single dwellings). Development of wind energy installations is also a potential threat.	
Knockbrack AP		
2431	Oughterard District Bogs NHA	See above
2364	Moycullen Bogs NHA	See Above
Lettermuckoo AP		**None**
Cappaghoosh AP		**None**

MAYO

ROSCOMMON

GALWAY

CLARE

TIPPERARY

Cappaghoosh

Knockbrack

Lettermuckoo

SA - Strategic Areas

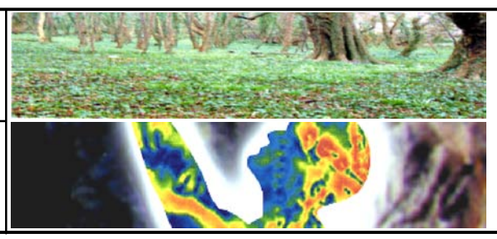
AP - Acceptable in Principle

Special Area of Conservation (SAC)

Special Protection Area (SPA)

0 5 10 20

Kilometres

DATE: 20/10/11	*SCALE: 1:400,000*	**FIGURE 4.4: NATURA 2000 SITES**	
REF: WES/xx	*SIZE: A3*	Galway County Council Wind Energy Strategy	
DRAWN: EV	*APPROVED: RM*		

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MAYO

ROSCOMMON

GALWAY

CLARE

TIPPERARY

Derryclare
Cappaghoosh

Leam West
Knockbrack

Lettermuckoo

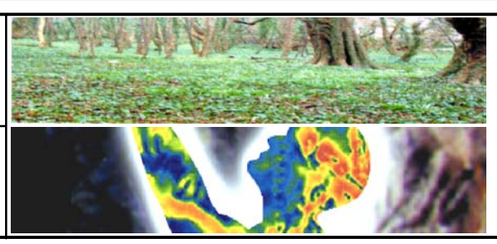
Richmond
Esker

Ballynastaig Wood
Coole - Garryland

Pollnaknockaun Wood
Derrycrag Wood
Rosturra Wood

- Nature Reserves
- SA - Strategic Areas
- AP - Acceptable in Principle
- National Park
- Natural Heritage Area (NHA)
- Proposed Natural Heritage Area (pNHA)
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)

0 5 10 20
Kilometres

DATE: 20/10/11	*SCALE: 1:400,000*	**FIGURE 4.5: NATURE DESIGNATIONS**	
REF: WES/xx	*SIZE: A3*	Galway County Council Wind Energy Strategy	
DRAWN: EV	*APPROVED: RM*		

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Site synopses are not currently available for the pNHAs but many of the pNHAs identified are also currently designated as cSACs or SPAs and have been assessed more closely under the HDA. Examples include Lough Corrib, Connemara Bog Complex, Rosslake and Maumturk Moutains. Table 4c presents these pNHAs

Table 4c: Proposed Natural Heritage Areas within 5km of draft WES areas.

PROPOSED NATURAL HERITAGE AREAS within 5km	
Strategic Area	
SITECODE	SITE_NAME
000297	Lough Corrib
002034	Connemara Bog Complex
002082	Oughterard National School
001271	Gortnandarragh Limestone Pavement
001312	Ross Lake And Woods
001312	Ross Lake And Woods
001260	Drimcong Wood
000228	Ballycuirke Lough
002083	Killarainy Lodge, Moycullen
Knockbrack AP	
SITECODE	SITE_NAME
000735	Maumtrasna Mountain Complex
002008	Maumturk Mountains
000297	Lough Corrib
002034	Connemara Bog Complex
002082	Oughterard National School
001312	Ross Lake And Woods
001312	Ross Lake And Woods
001260	Drimcong Wood
000228	Ballycuirke Lough
002083	Killarainy Lodge, Moycullen
000268	Galway Bay Complex
000268	Galway Bay Complex
001267	Furbogh Wood
Lettermuckoo AP	
SITECODE	SITE_NAME
002034	Connemara Bog Complex
000315	Oilean Na Ngeabhrog (Glencoh Rock)
002075	Kinvarra Saltmarsh
000314	Oilean Na Ngeabhrog (Illaungurraig)
Cappaghoosh AP	
SITECODE	SITE_NAME
002031	The Twelve Bens/Garraun Complex
002008	Maumturk Mountains
002034	Connemara Bog Complex

000315	Oilean Na Ngeabhrog (Glencoh Rock)

4.2.13 Ramsar Sites

Ramsar sites are designated and protected under the Convention of Wetlands of International Importance, especially as Water Fowl Habitat, which was established at Ramsar in 1971 and ratified by Ireland in 1984. Three Ramsar sites are located in County Galway comprising 29,997 hectares in total or 44.7% of the national total. Two of these are located in the western part of the county and are of relevance to the draft WES designations. The following synopses provide details on these sites:

Lough Corrib
Area: 17,728 ha Ramsar site no.: 846
The second largest lake in Ireland supports one of the largest areas of wetland vegetation consisting of reed, sedge and rush communities in the Country. Other habitats include Sessile Oak woodland, calcareous fen, callows grassland, marsh and raised bog with a soak system. The site provides important feeding grounds for waterbirds and supports internationally important numbers of several breeding and wintering waterbirds and nationally important numbers of numerous other waterbird species. The site supports the otter and numerous rare and threatened plant and fish species. Human activities include fishing and hunting.

Inner Galway Bay
Area: 11,905 ha Ramsar site no.: 838 The shallow sheltered part of a large sea bay with numerous intertidal inlets and small low islands composed of glacial deposits. The area provides important habitat for marine life along Ireland's west coast. The site supports the richest seaweed flora on the Irish Coast (500+ species) and 65% of the Irish marine algal flora occur in the area. The site supports internationally and nationally important numbers of numerous species of water birds. There is a large cormorant colony on Teer Island. Human activities include aquaculture.

4.2.13 Nature Reserves

A Nature Reserve is an area of importance to wildlife, which is protected under Ministerial order. There are eight Nature Reserves in County Galway, of which two are located within 5km of the wind energy areas, these are discussed below.

- Leam West Nature Reserve is within 5km of the Knockbrack Acceptable in Principle Area. Situated two miles south east of Maam Cross. **Area (ha.):** 373.48 The bog is of international importance. It is an area of very diverse blanket bog developed over both acid and base rich rocks at the north east limit of the Connemara blanket bogs. It forms part of one of the largest areas of intact bog in Connemara and it is one of the few sites containing both lowland and highland bog. A large number of habitats occur including rock outcrops, bog pools, extremely wet quaking areas, streams and relatively nutrient rich flushes. Established in 1991. State owned.

- Derryclare Nature Reserve is within 5km of Cappaghoosh Acceptable in Principle area. This nature reserve is part of the much larger Twelve Bens/Garraun Complex (Special Area of Conservation, site code: 002031). It is of particular

interest as it supports Sessile Oak Woodland, a rare habitat in Connemara. Derryclare Wood is composed principally of Sessile Oak, with some Rowan, Downy Birch and occasional Ash forming the canopy. Well developed lichen and fungus flora are also present. Irish hare, otter, freshwater pearl mussel adnd common frog have been recorded from the overall site.

4.2.14 Connemara National Park[1]

Connemara National Park covers some 2,957 hectares of scenic mountains, expanses of bogs, heaths, grasslands and woodlands. Some of the Park's mountains, namely Benbaun, Bencullagh, Benbrack and Muckanaght, are part of the famous Twelve Bens or Beanna Beola range. Connemara National Park was established and opened to the public in 1980. Western blanket bog and heathland are the predominant vegetation types to be found in the Park. The boglands, situated in the lowlying areas, are normally very wet, while higher up the mountains, a drier community of mountain blanket bog develops. Heather covers the mountain sides, with ling, cross-leaved heath and bell heather all very common. Probably the most common and most abundant plant in the Park is purple moor grass, responsible for the colour of much of the landscape throughout the year. Insectivorous plants form an integral part of the bog community. Sundews and butterworts trap and digest insects with their leaves to gain nutrients, which are in short supply in the bogs. Rare plant species from the colder areas of Europe and the Arctic may be found high up in the mountains, such as roseroot, purple and starry saxifrages, lesser twayblade, and mountain sorrel. Conversely, plants from Spain and Portugal are also found in the Park, notably pale butterwort, St. Dabeoc's heath, which is a member of the heather family, and St. Patrick's Cabbage.

The birdlife of the Park is varied. Meadow pipits, skylarks, stonechats, chaffinches, robins and wrens are just some of the common song-birds within the Park. Birds of prey are sometimes seen, usually kestrel and sparrowhawk, with merlin and peregrine falcon making occasional visits. Winter brings an increase in the numbers in the Park of some species native to Ireland such as woodcock, snipe, starling, song thrush and mistle thrush, augmented by visitors from other parts of Ireland and abroad as well as winter migrants from north eastern Europe such as redwing and fieldfare. Rabbits, foxes, stoats, shrews, and bats are often observed at night. In recent years both pine marten and non-native mink have been seen, the latter is a threat to native wildlife species. The largest mammal in the Park is the Connemara Pony. Although a domestic animal this pony is very much part of the Connemara countryside. A herd of pure-bred Connemara Ponies was presented to the State by the late President Childers and the herd is currently managed under agreement with the Connemara Pony Breeders' Society. The Park lands are now wholly owned by the State and managed solely for National Park purposes.

4.2.15 Protected Species

In addition to certain species already mentioned including the Freshwater Pearl Mussel, Artic Char and pine marten, County Galway supports a number of other species that are legally protected under the Flora Protection Order in the Wildlife (Amendment) Act 2000.

[1] This text is taken from www.connemaranationalpark.ie/wildlife.

All native mammals are also protected within the Wildlife Acts and species listed on Annex I and Annex II of the EU Habitats Directive are also protected in law.

4.2.16 Landcover in WES and surrounding areas

As indicated already, much of the area under consideration for Wind Energy is composed of peat soils and bogs. The table below shows the Corine 2006 Landcover Data for the WES areas.

Strategic	Frequency	Hectares	% total
Agricultural Land	1	11.89	0.22%
Forestry	11	2264.67	41.82%
Natural and semi-Natural Vegetation	5	2081.68	38.44%
Pasture	1	3.13	0.06%
Peatbog	2	1054.11	19.46%
Knockbrack			
Agricultural Land	6	37.44	0.73%
Artificial Surfaces	1	36.07	0.70%
Forestry	15	1146.99	22.24%
Natural and semi-Natural Vegetation	13	1992.20	38.64%
Pasture	5	49.19	0.95%
Peatbog	2	1894.43	36.74%
Water	1	0.01	0.00%
Cappaghoosh			
Forestry	3	214.90	33.51%
Natural and semi-Natural Vegetation	2	420.47	65.56%
Peatbog	1	5.95	0.93%
Lettermuckoo			
Agricultural Land	2	31.17	2.52%
Natural and semi-Natural Vegetation	1	14.71	1.19%
Pasture	2	7.86	0.64%
Peatbog	3	1141.85	92.35%
Water	2	40.84	3.30%

4.2.17 Existing Environmental Problems relating to Biodiversity, Flora and Fauna in County Galway

The County Galway Biodiversity Action Plan 2008 -2013 identifies the following problems:

- Expansion of towns and villages in the urban fringe and rural areas can cause significant habitat destruction, fragmentation and degradation as natural habitats including wetlands, woods and grasslands are being cleared or fragmented to accommodate new development.

- The loss of traditional stone walls and hedgerows is of particular concern in many parts of the county.
- Problems associated with changes in land use and farming practices are also evident in many parts. Large scale drainage, fertilisation and reseeding of farmland have resulted in the huge loss of wetlands, hedges and species-rich grasslands as well as in the pollution of ground and surface waters.
- In some parts of the county, there is increasing evidence of habitat change caused by the abandonment of agriculture. In the absence of regular management, lands can become rank and overgrown by weeds, bracken, bramble and scrub, leading to the loss of semi-natural grasslands and an overall loss in diversity.
- The problem of invasive alien species has become very prominent in recent years as a number of introduced plant and animal species have become ecological pests. Some examples include the African Pond Weed, 'Giant Rhubarb', Japanese (Gunnera) Knotweed, Rhodedendron, the Zebra Mussel and the American Mink.

4.2.18 Environmental Problems in neighbouring counties.

The West Regional Planning Guidelines 2010-2022 identify the following pressures on biodiversity, flora and fauna:

- Habitat Destruction & Impact on Ecological Networks
- Changes in landcover
- Pressures on Species and ecosystems
- Erosion and Pollution
- Development on floodplains/ wetland areas
- Climate Change

More specifically, the following environmental problems are identified for neighbouring local authorities:

Galway City[2] - A substantial amount of lands in the city are in a natural state or semi-natural in character. The city also contains an extensive range of natural heritage areas with designated sites of international and national importance. Areas of local ecological importance have also been identified for their biodiversity value. There is potential for loss of habitats through development

County Mayo – habitat destruction and fragmentation, land clearance and development pressure, poorly managed commercial forestry, drainage, pollution, invasive species and climate change[3].

County Roscommon[4] **–**
Roscommon County Council recognises the impact certain development activities may have upon vulnerable lands such as peatlands, where the hydrology of the peat habitat

[2] Taken from Galway City Development Plan 2011 – 2017 SEA ER
[3] Taken from the County Mayo Draft Renewable Energy Strategy SEA ER 2011
[4] The SEA ER of the County Roscommon Development Plan 2008 – 2014 does not identify existing environmental problems for biodiversity. The above information has been taken from the following source instead: SEA Screening Statement of Draft Wind Energy Strategy for Roscommon 2011. Subsequent baseline information for Roscommon are taken from the SEA ER of the CDP

and system may be affected by development. It is acknowledged that in some areas identified as most favoured and less favoured, peatland exists. The impact of a development on these lands may relate to hydrological issues and disturbance of species. The necessary investigations and hydrological assessments will be a prerequisite on such lands to ensure that potential impacts are minimised on site and beyond the site. The recognised impacts to NHA and pNHA bogland habitats are as follows:

- Drainage
- Excavation
- Cutting
- Burning
- Grazing
- Dumping
- Development of access roads

County Offaly[5]

As a result of agriculture in certain areas of the County, species-poor swards of ryegrass and white clover have dominated, species-diverse wetlands have been drained and hedgerows have been removed in order to make fields bigger and more suited to machinery.

Rare bog habitats have been depleted since the introduction of industrial peat harvesting, significantly and adversely impacting upon the County's biodiversity. Aquatic flora and fauna is vulnerable to all forms of pollution such as that which can occur as a result of peat silt and sediment.

County Tipperary[6]

Many species of flora and fauna have been introduced to Ireland and pose deleterious threats to native vegetation, wildlife and their ecosystems. Of particular relevance in North Tipperary are the Zebra Mussel, Nuttall's pondweed, Japanese knotweed and blue green algae. The Site Synopses for certain designated sites identify threats to the conservation value of these sites. Lough Derg shares a boundary with Galway, and the threats to that site are identified as being nutrient enrichment, presence of zebra mussel and recreational activities.

County Clare[7]

The same threats to bog habitats as listed for Roscommon are identified in County Clare; in addition, water bodies face threats from housing development, pollution, drainage and run off from agriculture.

Other more general threats to biodiversity include habitat loss and fragmentation, invasive species, declining agricultural activity, development, run off, contaminated sites, nutrient inputs from forestry. Ecological networks can also be impacted upon and fragmented through development on agricultural or upland sites. The provision of infrastructure, particularly, new road developments can also have a negative impact on biodiversity, flora and fauna through the disruption of an ecological network. A common concern in relation to wind energy developments relates to impacts on peat soils and hydrogeology, impacts on bird species, and habitat disturbance

[5] Taken from County Offaly Development Plan 2009-2015 SEA ER
[6] Taken from the North Tipperary County Development Plan 2010 – 2016 SEA ER
[7] Taken from the County Clare Wind Energy Strategy 2009 -2015 SEA ER

4.2.19 Likely Evolution of Biodiversity, Flora and Fauna in the absence of the WES

In the absence of the WES, the wind energy policies and guidelines contained in the current County Galway Development plan 2009-2015 will remain the key guiding framework for wind energy developments within the County. Such policies do not take account of recent designations for example parts of the Sliabh Aughties are currently designated as 'strategic areas'; but have also been designated as a Special Protection Area for Hen Harriers. Thus the existing wind energy designations in parts of the county do not reflect recent natural heritage designations.

In addition, the methodology to designate wind energy areas has been informed by the most current available information and excludes all Natura 2000, NHA and other designated sites within the county, thus offering further protection to wind energy developments. Moreover, the threats to biodiversity from climate change and traditional energy sources present their own threats to ecological resources within the county, and the WES offers a strategic and coordinated approach to wind energy that is not solely informed by landscape considerations.

There would be no framework directing wind energy and supporting infrastructure to the most environmentally appropriate areas in the county.

4.3 Water Resources

4.3.1 General

County Galway has a significant number of loughs, rivers and of course estuarine and coastal water resources. Principal rivers in the County are the River Corrib, River Suck and River Shannon. Lough Derg in the east of the county is the largest lake on the River Shannon, and Lough Corrib is the largest lake in the Republic of Ireland. Since 2000, Water Management in the EU has been directed by the Water Framework Directive 2000/60/EC (WFD). The WFD has been transposed into Irish legislation by the European Communities (Water Policy) Regulations 2003 (SI No. 722 of 2003). The WFD requires that all member states implement the necessary measures to prevent deterioration of the status of all waters - surface, ground, estuarine and coastal - and protect, enhance and restore all waters with the aim of achieving good status by 2015.

For the purpose of implementing the WFD, Ireland has been divided into eight river basin districts (RBDs) or areas of land that are drained by a large river or number of rivers and the adjacent estuarine / coastal areas. The management of water resources will be based upon these river basin districts. The west and centre of County Galway is located within the Western RBD while the east of the County is located within the Shannon RBD. Within each river basin district water has been divided into groundwater, rivers, lakes, estuarine waters and coastal waters which are in turn divided into specific, clearly defined water bodies. This is for the purpose of assessment, reporting and management.

For the purposes of this SEA ER, the primary focus will be on the Western RBD as this is where the primary areas proposed for Wind Energy are located.

4.3.2 Surface Waters

Figure 4.6 shows the most recent water quality data for various rivers and lakes throughout the County. Water Management Units have been prepared for sub basins within the Western River Basin District and this provides useful information on water quality and management issues within the western Galway area. This is presented below for the key catchments associated with the draft WES areas. Thereafter more detailed information is provided on water quality within each of the draft WES areas.

32 local authority water supplies in County Galway were identified by the EPA for Remedial Action in 2009.

The Corrib Water Management Unit Action Plan (2010) identifies the overall status of the Corrib catchment as follows:

- 68% of the rivers at high or good status, the remaining 34% at moderate or poor status.
- 20 lakes within the unit are at high or good status, 40% at moderate status. Lough Corrib itself is classified at moderate status.

There are also a number of smaller lakes within the areas that are too small for classification under the Water Framework Directive but nonetheless represent an important water resource for the western area of Galway.

However, whilst current status may be good, the WFD Risk Assessment identifies Lough Corrib as being at significant risk of meeting the objectives of the WFD by 2015. Factors contributing to this classification in the Upper and Lower Corrib are:

- morphological pressures due to impoundments; and,
- point source pressures due to Section 4 (Local Authority licensed discharges) and waste water treatment plants.

The majority of other lakes in the County occur to the west of Lough Corrib. Most of these lakes are classified as either (2a) not at significant risk or (2b) probably not at significant risk of meeting the objectives of the WFD by 2015 however a number of the lakes including Lough Inagh, Derryclare Lough, Kylemore Lough, Ballynakill Lough, Lough Anaserd and Ballycuirke Lough are classified as either (1a) at significant risk or (1b) probably at significant risk.

The following Table 4d presents the most recent water quality data for the Lakes within the WES areas, plus 5km outside the boundaries.

Strategic Area	**Water Quality**	**%**
	High	30.02
	Good	26.14
	Moderate	43.84
Knockbrack		
	High	5.17
	Good	3.23
	Moderate	91.60
Cappaghoosh		

	High	69.60
	Good	7.10
	Moderate	23.30
Lettermuckoo		
	High	41.96
	Good	58.04

Figure 4.7 shows the river catchment systems in the County in relation to the strategic and acceptable in principle zones. Table 4e presents further information on river water quality within 5km of the WES areas. As the table below demonstrates for three WES areas, over half the river sampled are identified as being of 'good' status. Lettermuckoo contains the highest proportion of 'high' status river water quality and contains no rivers identified as 'poor' quality. For the Strategic and Knockbrack WES areas, poor water quality is identified for 11.89 and 10.56% respectively.

Table 4e: River Water Quality within 5km of WES areas

Strategic	**FREQUENCY**	**Length Km**	**%**
Good	21	58.14	58.87%
High	11	13.90	14.07%
Moderate	3	14.98	15.17%
Poor	4	11.74	11.89%
Knockbrack	**FREQUENCY**	**Length Km**	**%**
Good	30	92.02	54.93%
High	19	23.26	13.88%
Moderate	12	34.55	20.62%
Poor	4	17.69	10.56%
Cappaghoosh	**FREQUENCY**	**Length km**	**%**
Good	11	20.39	52.61%
High	7	12.40	31.99%
Moderate	5	5.97	15.40%
Lettermuckoo		**Length km**	**%**
Good	3	9.33	31.09
High	8	20.68	68.91

Figure 4.9 shows freshwater SACs and SPAs in the western half of the County.

4.3.3 Groundwater

Groundwater is a further significant resource and refers to water stored underground in saturated rock, sand, gravel, and soil. Surface and groundwater functions are closely related and form part of the hydrological cycle. The protection of groundwater from land uses is a critical consideration and groundwater vulnerability is becoming an important management tool. The entire island of Ireland has been designated as a Protected Area for Groundwater under the WFD.

Figure 4. 8 shows groundwater vulnerability zones and the current surface and groundwater abstraction sites within the Strategic and Acceptable in principle areas. In addition to ecological functions, surface and groundwater water continues to be a significant resource for residential and agricultural uses notably abstraction.

Groundwater that readily and quickly receives water (and contaminants) from the land surface is considered to be more vulnerable than groundwater that receives water (and contaminants) more slowly and in lower quantities. The classification of extreme or high vulnerability means that the groundwater in these areas is very vulnerable to contamination due to hydrogeologcial and soil factors.

The less productive aquifers - labelled Poor aquifers - underlie the western half of the County and the south eastern, more upland area of the County. These aquifers have the potential to be productive in local zones. These aquifers are generally of low vulnerability; groundwater bodies underlying the western, north eastern and south eastern parts of the County are classified as being either (2a) not at significant risk or (2b) probably not at significant risk.

4.3.4 Estuarine

A number of areas are already designated as Shellfish Waters in County Galway. This means The European Communities (Quality of Shellfish Waters) Regulations 2006 give legal protection to a number of shellfish waters areas and place an onus on public authorities in Ireland to ensure that the water quality in those areas is protected. The Shellfish Waters Directive is designed to put in place concrete measures to protect waters, including shellfish waters, against pollution and to safeguard certain shellfish populations from various harmful consequences, resulting from the discharge of pollutant substances into the sea. The Directive applies to the aquatic habitat of bivalve and gastropod molluscs only; it does not include crustaceans such as lobsters, crabs and crayfish. Areas in Galway already designated are listed as follows:

- Kilkieran Bay, Co. Galway.
- Clarinbridge/Kinvara, Co. Galway.
- Aughinish Bay, Co. Galway.

In addition, estuarine systems are important nursery and breeding areas for many commercial fish species and for the County‟s production areas including those in Killary harbour, Kilkieran Bay, Clarinbridge/Kinvara Bay and Augnish Harbour.

4.3.5 Coastal

The EPA data from 2009 identifies 11 bathing water areas in County Galway, of which 10 are located along the coast. 9 of these are identified as compliant with EU Guide and Mandatory Values and are of ‘Good quality’. Tra na Forbacha on southern Galway coast is identified as ‘Sufficient’ quality, compliant with EU Mandatory values only. Clifden on the western coast is identified as poor water quality – non compliant with EU Mandatory values. A further two bathing waters are located in Galway City, at Salthill and Silverstrand.

4.3.6 Blue Flag and Green Coast Beaches

The Blue Flag is awarded to beaches and marinas that meet a specific set of criteria including: Environmental Information and Education, Water Quality, Safety and Services and Environmental Management.
The four beaches in County Galway which were awarded the Blue Flag for 2010 are as follows:

- The Long Point, Loughrea Lake
- Trá an Dóilín, An Cheathrú Rua
- Trá Mór Coill Rua, Indreabhán
- Trá Cill Mhuirbhigh, Inis Mór

Four Beaches in County Galway were awarded Irish Green Coast Award. This award recognises coastal areas which have excellent water quality, have entered a yearly environmental management plan drawn up in consultation with the local community and other stakeholders. These awards are seen as a complimentary award to the Blue Flag Campaign.
The following beaches in County Galway have received the Green Coast Award:

- Dogs Bay , Roundstone,
- Tra Inis Oirr,
- Dumhach , Inish Boffin,
- Est End, Inis Boffin.

Figure 4.10 shows all Blue Flag and Green Coast beaches in the County.

4.3.7 Key Environmental Problems for Water

The SEA ER of the WRBD Management Plan identifies the following environmental pressures on surface and groundwater quality:

Wastewater and Industrial Discharges
Inadequately treated effluents and spills or leakage from sewerage networks can lead to unacceptable levels of pollutants in receiving waters. These pollutants can damage water quality and downstream uses (for example bathing waters, shellfish waters or waters supporting sensitive species). In the Western District, estimates indicate that municipal and industrial discharges produce over 16% of the yearly phosphorus load and 3.5% of the nitrogen load. There have been cases of rivers and coastal areas (such as Galway City) that have been seriously polluted by this type of discharge and in response facility improvements are being put in place in many urban areas.

Landfills, Mines, Quarries and Contaminated Sites
Waste disposal sites (including old un-lined landfills), quarries, mines, gasworks sites and industrial lands produce lesser discharges to waters than wastewater plants and industries; however, subsurface residues or waste may continue to threaten groundwater and surface waters.

MAYO

ROSCOMMON

OFFALY

TIPPERARY

CLARE

Mask

Cappaghoosh

Knockbrack

Lettermuckoo

Lakes

Water Quality

- High
- Good
- Moderate
- Poor
- Bad
- Not Cl

0 5 10 20

Kilometres

DATE: 20/10/11	*SCALE: 1:400,000*	**FIGURE 4.6: LAKE WATER QUALITY**	**minogue & associates** Tuamgraney, County Clare T: 061 640667 **ERA-MAPTEC** 40 Lwr. O'Connell St. Dublin 1 www.era.ie
REF: WES/xx	*SIZE: A3*	Galway County Council Wind Energy Strategy	
DRAWN: EV	*APPROVED: RM*		

MAYO

ROSCOMMON

OFFALY

TIPPERARY

CLARE

Mask

Cappaghoosh

Knockbrack

Lettermuckoo

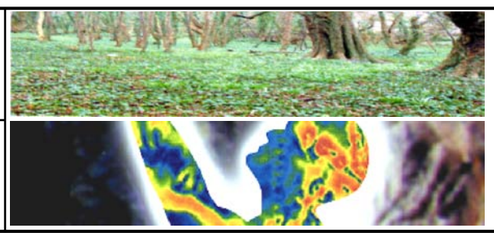
Rivers

Water Quality

- High
- Good
- Moderate
- Poor
- Bad

- SA - Strategic Areas
- AP - Acceptable in Principle

0 5 10 20
Kilometres

DATE: 20/10/11	*SCALE: 1:400,000*	**FIGURE 4.7: RIVER WATER QUALITY**	
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