Appendix B

EIS Scoping Report

Corrib

onshore pipeline

EIS SCOPING REPORT

30th April 2007

RPS

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APPENDICES

1 INTRODUCTION

Shell E&P Ireland Ltd (SEPIL) propose to construct an onshore upstream gas pipeline to connect the Corrib Gas Field and offshore pipeline to the permitted Gas Terminal (at Bellanaboy Bridge, north west Mayo) where the gas will be treated and subsequently distributed into the existing Bord Gáis Éireann gas transmission network at Bellanaboy.

The 'Corrib Field Development (Offshore Field to Gas Terminal)' Environmental Impact Statement (EIS) was prepared in 2001 in respect of the offshore and onshore elements of the pipeline between the gas field and Terminal. However, following an independent safety review requested by the Minister for the Department of Communications, Marine and Natural Resources (Advantica Report, January 2006) and an independent mediation process conducted by Peter Cassells (July, 2006) with local residents and SEPIL it was recommended that the onshore section of the pipeline be rerouted away from dwellings in Rossport.

A route selection study is underway to identify a preferred route for the onshore pipeline between the landfall (of the offshore pipeline), and the Gas Terminal at Bellanaboy Bridge. The preferred route will undergo a full Environmental Impact Assessment (EIA) to assess potential impacts from the proposed development. In this context Scoping of the Environmental Impact Statement (EIS) is now required.

This Scoping Report outlines the information proposed to be included in the EIS for the onshore gas pipeline element only. It should be noted that the report is an evolving document and information requirements of the EIS may change as the project develops.

1.1 PROJECT BACKGROUND

The Corrib Gas Field, which is located in the Northeast Atlantic Ocean approximately 65km off the coast of Mayo, was discovered in 1996, and represents the first significant natural gas find in Ireland for over 20 years. In April 2002 SEPIL obtained consent under the Gas Act from the Department of Communications, Marine & Natural Resources (DCMNR) to construct a gas pipeline between the Gas Field and the Gas Terminal to be located at Bellanaboy Bridge, Co. Mayo. However, as discussed above it has been recommended that the onshore section of this pipeline be re-routed to avoid dwellings in Rossport. It is in this regard that SEPIL appointed RPS Group (RPS) in January 2007 to undertake the route selection process to identify a preferred route between a landfall and the proposed Gas Terminal at Bellanaboy; and to prepare the EIS for the selected route.

The Corrib Natural Gas Field Development can be divided into four distinct elements:

1. Offshore seabed installations (Gas Field) and offshore pipeline - EIS completed[1]

2. **Onshore gas pipeline between a landfall and Gas Terminal at Bellanboy Bridge – subject to a route selection study.**

3. Gas Terminal[2] – Planning Permission granted in 2004. Draft decision on IPPC Licence given by EPA in January 2007.

[1] EIS – Corrib Field Development (Offshore Field to Terminal), November 2001

[2] EIS – Corrib Gas Field Development (Proposed Bellanaboy Bridge Gas Terminal and associated Srahmore Peat Deposition Site) - Dec 2003

4. Onshore 150km Mayo to Galway Pipeline that will export gas from the Gas Terminal to the national gas grid – constructed in 2006.

1.2 PROJECT DESCRIPTION

The proposed development has two principal components, which are described further below:

- Landfall facilities (for the offshore element of the pipeline); and
- Onshore Gas Pipeline.

1.2.1 Landfall Facilities

The landfall facility, which will be located along the coast of the study area (see Figure 1.1), will consist of a valve installation (to isolate the offshore and onshore sections of the pipeline and to limit the maximum pressure in the onshore section to 144bar). The main isolation valve will be located below ground level while the smaller pressure limiting valves and associated pipework will be above ground. Valve actuators (used to operate the valves) and instrumentation/control cabinets will be located above ground. These facilities will be located within a compound with dimensions approximately 25m x 30m. This installation will remain in place for the lifetime of the project.

A number of alternative landfall locations will be examined during the route selection process.

1.2.2 Onshore Pipeline

The onshore pipeline will connect the landfall of the offshore pipeline to the Gas Terminal, where the gas will be treated before it is exported into the BGE network. The gas pipeline is designed to very high standards[3] so it can safely handle the pressure of the gas in the pipeline. The normal operating pressure of the pipeline will be approximately 120 bar. The pressure in the onshore gas pipeline, will not exceed 144 bar[4] and will be continuously measured.

The 508mm (20 inch) outside diameter pipeline is made of high-grade carbon steel and will be buried to a minimum depth of 1.2m below ground level throughout the route. The wall of the pipeline will be 27 millimetres thick. External corrosion will be prevented via a 3-layer polypropylene coating and an impressed current cathodic protection system.

The pipeline is protected from internal corrosion, through the injection of inhibitor chemicals from the onshore Gas Terminal (via the umbilical link). A number of monitoring tools will also be used to gather data on the internal condition of the pipe and to confirm its integrity along its full length. Methanol, which acts as an anti-freeze, will also be injected from the Gas Terminal (via the umbilical) to prevent the formation of hydrates or ice crystals, which could cause a blockage.

[3] Standards - IS EN 14161 will be used as the design code, however where provisions of BS1080 and IS328 exceed those of IS EN 14161 these will apply.

[4] As recommended in the Advantica Report, July 2006.

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Project:

Corrib
Onshore Pipeline

Title:

STUDY AREA

Drawn by:	HF	Job No:	MDR0470
Checked by:	MO'R	File No:	MDR0470FG0001.1R01
Approved by:	CC	Drg. No:	Fig. 1.1
Scale:	NTS	Rev:	R01
Date:	April '07		

1.2.2.1 Umbilical Link

An umbilical link comprising controls, power and chemical injection, which will control the operations of the gas field will be installed alongside the onshore pipeline during the same construction period. It will also be buried throughout its length. It will be approximately six inches in diameter and contain electrical power cables, signal cables, hydraulic fluid lines and chemical injection lines.

1.2.2.2 Discharge Pipeline

A 254mm (10 inch) diameter outfall pipe made of high-density polyethylene (HDPE) will be buried in the same trench as the gas pipeline to assist with the removal of treated waste water from the Gas Terminal operations.

1.2.3 Lifetime/Decommissioning

The construction of the pipeline and landfall will take approximately 3-6 months to complete (see Section 2.2 for details on construction methods). Once the pipeline and landfall are constructed and are in operation, no further disturbance to land will be required except for monitoring purposes.

Decommissioning of the pipeline and landfall will occur when the resources of the Corrib Gas Field have been exhausted (predicted to be 15-20 years after development). Decommissioning will involve the removal of any above ground facilities at the landfall and any remaining gas from the pipeline. The gas pipeline may remain in situ subject to the agreement of the relevant authorities.

1.3 NEED FOR DEVELOPMENT

The Corrib Gas Field development is important for Ireland as it offers important security of energy supply in Ireland in the coming years in addition to significant inward investment for County Mayo. At peak production, it is estimated by independent sources that the Corrib Gas Field will provide up to 60% of the annual gas demand in Ireland.

At present, there are only two sources of Irish natural gas, the Kinsale Head gas field and the Seven Heads gas field off the coast of Cork, both of which are producing relatively small quantities of gas. The demand for gas in Ireland is growing rapidly, due principally to its increasing use for power generation to meet rising demand for electricity. Demand for gas powered electricity generation is expected to continue to grow as other less environmentally acceptable fuels are phased out in order to achieve Ireland's emissions reduction targets for greenhouse gas emissions under the Kyoto Protocol.

According to the Department of the Environment[5], "*Ireland's isolation from the European energy infrastructure heightens the need for security of energy supplies, efficient energy infrastructure, and for development of indigenous resources to the maximum possible.*" Ireland currently imports between 80 and 85% of its gas through inter-connectors with Scotland. More than half of Ireland's electricity is generated by natural gas, which means that the country would be vulnerable in the event of a gas shortage. The International Energy Agency (IEA) stated in June 2003[6] "*Energy security receives significant attention in Ireland. These concerns are fuelled in part by the country's lack of substantial domestic energy sources and consequent high level of imports. The country's relative isolation and*

[5] Department of Environment Heritage and Local Government Press release, 2002

[6] Energy Policies of IEA Counties Ireland, 2003 Review

lack of extensive international energy connections also exacerbate Ireland's vulnerability to supply disruptions and/or price spikes."

In terms of consumer supply, there is now a gas transmission network connecting Galway, Limerick, Cork and Dublin, and a pipeline has been constructed between the ring main in County Galway to a point close to Bellanaboy Bridge Gas Terminal. The Commission for Energy Regulation (CER) has recently announced that gas spur lines will be provided to a number of towns in the western region, including Castlebar and Ballina. Providing additional supply capacity and providing a new source of gas will act to reduce the risk of gas and electricity shortages in the future. Against this background, it is more important than ever that Corrib Gas is brought to the Irish market as quickly as possible.

Whilst the specific proposal in this instance comprises the onshore section of the overall gas pipeline, and its associated elements, this must be considered as an essential component of the overall Corrib Gas Project. The onshore gas pipeline will link the offshore pipeline to the Gas Terminal at Bellanaboy Bridge, and is therefore a vital component in ensuring the overall security of gas energy supply, as referred to above.

2 ONSHORE PIPELINE ROUTE SELECTION

The original route for the pipeline from the landfall at Dooncarton via the Rossport area north of Sruwaddacon Bay to the Gas Terminal was selected following a series of detailed route selection studies. RPS are now investigating alternative pipeline route options and alternative landfall options. A study area (see Figure 1.1) has been selected based on the location of the Gas Terminal and the distance between it and potential landfall locations. Details of the study area are outlined in Section 2.1.

In general, all attempts are made to select the shortest pipeline route between the origin and destination. This is done in order to reduce the overall impacts to land and communities along the route. Every attempt will be made to avoid known constraints such as population centres and houses, environmentally sensitive areas, archaeological sites etc. However, in some instances, it is not possible to avoid all known constraints. In such circumstances, every effort is made to minimise and mitigate any potential impact.

The route selection process will be undertaken in three phases as follows:

Preliminary Route Corridor Selection (Phase 1)

The main aim at this stage will be to identify suitable route corridor options, i.e. broad stretches of land within which the pipeline could possibly be routed. This involves undertaking desk based studies (flora & fauna, archaeology and landscape) and on-site visual surveys of the study area, together with community consultation regarding selection criteria which the community consider should be identified when assessing potential routes (see Section 3.3.2). At this stage, visual surveys will be conducted from public roads and accessible vantage points. **RPS are currently in this stage of the route selection process.**

Detailed Route Corridor Selection (Phase 2)

The second phase involves detailed examination of the preliminary route corridor options in order to identify a smaller number of preferred route options. This will involve detailed walk over surveys by pipeline route engineers and specialists e.g. ecologists, hydrogeologists, archaeologists, etc., and ongoing consultation with landowners and the local community. Permission will be sought from landowners prior to any entry onto their land to carry out these initial feasibility investigations. In situations where geophysical & geotechnical surveys are required within the foreshore, a Foreshore Licence will be sought prior to the detailed surveys being undertaken.

Detailed Route Selection (Phase 3)

The second phase of the route selection, detailed above, will confirm the inability of a number of route corridor options to accommodate the onshore pipeline, and these are discounted at this stage. Detailed analysis of possible specific routes within the remaining corridors will then be carried out. The aim is to select one preferred route. This short listing of routes and the eventual identification of a preferred route, will take into consideration the following:

- All data available and gathered during visual and walkover surveys
- Input from relevant landowners and the local community and other parties and bodies
- Expert opinions provided by specialists

- Construction issues

The emerging preferred routes will be thoroughly assessed in the Environmental Impact Assessment (EIA) process. Consents for the final route will be required from both An Bord Pleanála under the Strategic Infrastructure Act, 2006 and the DCMNR under the Gas Act, 1976 (Section 40). An EIS will accompany both applications.

2.1 STUDY AREA

A study area (see Figure 1.1) has been selected based on the location of the Gas Terminal and the distance between it and potential landfall locations. The following sections provide a description on the study area:

2.1.1 Land Use

In general, the area is sparsely populated, with individual dwellings and farmsteads well spaced and scattered throughout the area. Scattered communities occur throughout the area, including those at Portacloy, Carrowteige, Porturlin, Kilgalligan, Rossport, Pollatomish, Inver and Barnatra. Small numbers of residential properties tend to be clustered varyingly on and around small areas of improved grassland and along the more distant coastal edge where the land is of a more improved nature.

The area of the proposed development also consists of significant areas of improved grassland (mostly in the form of reclaimed blanket bog), forestry plantations (on peat) and areas of intact and modified lowland atlantic blanket bog, such as parts of the Glenamoy Bog complex. Many of the bog areas have been modified by human activity, such as turf cutting or draining.

2.1.2 Tourism[7]

The study area comprises the North West section of County Mayo and includes the Mullet Peninsula, Carrowmore Lake and many coastal areas and islands. The main centres for tourism in the study area are Bangor, Pollatomish, Rossport, Belderg, Portacloy and Belmullet. This is a rural area and is mostly known for its outdoor sports (angling, boating, surfing, walking, cycling, etc.) and scenic landscape. The towns and villages in the study area also offer a wide range of museums, shops, restaurants, pubs, artists and artisans. The study area forms part of the Mayo Gaeltacht, mainly concentrated in parts of The Erris region.

The study area is a rural area combining both coastal and upland landscapes with rich scenic resources and a distinctive culture. Visitors are attracted to the region for its tranquillity, unspoilt landscape and traditional community structure. Tourism in this area mainly focuses on angling, boating horse riding, hill walking, cycling and the North Mayo Sculpture Trail. The principal amenity activities in the area are walking on surrounding roads and hills, and fishing the local streams and Carrowmore Lake. The study area forms part of the Mayo Gaeltacht. The fifteen-piece North Mayo Sculpture Trail, 'Tír Sáile', which extends from Ballina to Blacksod via Belmullet, runs through the study area.

[7] www.irelandwest.ie

2.1.3 Population

While Ireland as a whole has experienced significant economic growth over the last decade, this has not had as great an impact on the west of the country. Generally, County Mayo and the west of Ireland is characterised as a rural area with a weak urban base and poor infrastructure relative to the rest of the State. The area has suffered from continual economic decline stretching back to the early 1800's. Whilst the percentage increase in population from 2002 to 2006 was 5.3% (CSO) most of the rural areas are continuing to decline with the urban centres accounting for recent population growth.

2.1.4 Designated Conservation Areas

Special Areas of Conservation, Special Protected Areas and Natural Heritage Areas lie within the study area (see Figure 2.1, 2.2 and 2.3). Legislation governing the protection of these sites is as follows:

- European Communities (Natural Habitats) Regulations, 1997 (S.I. No. 94 of 1997);
- European Communities (Natural Habitats) (Amendment) Regulations, 2005 (S.I. 378 of 2005);
- Wildlife Act, 1976; and
- Wildlife (Amendment) Act, 2000, with their associated statutory instruments.

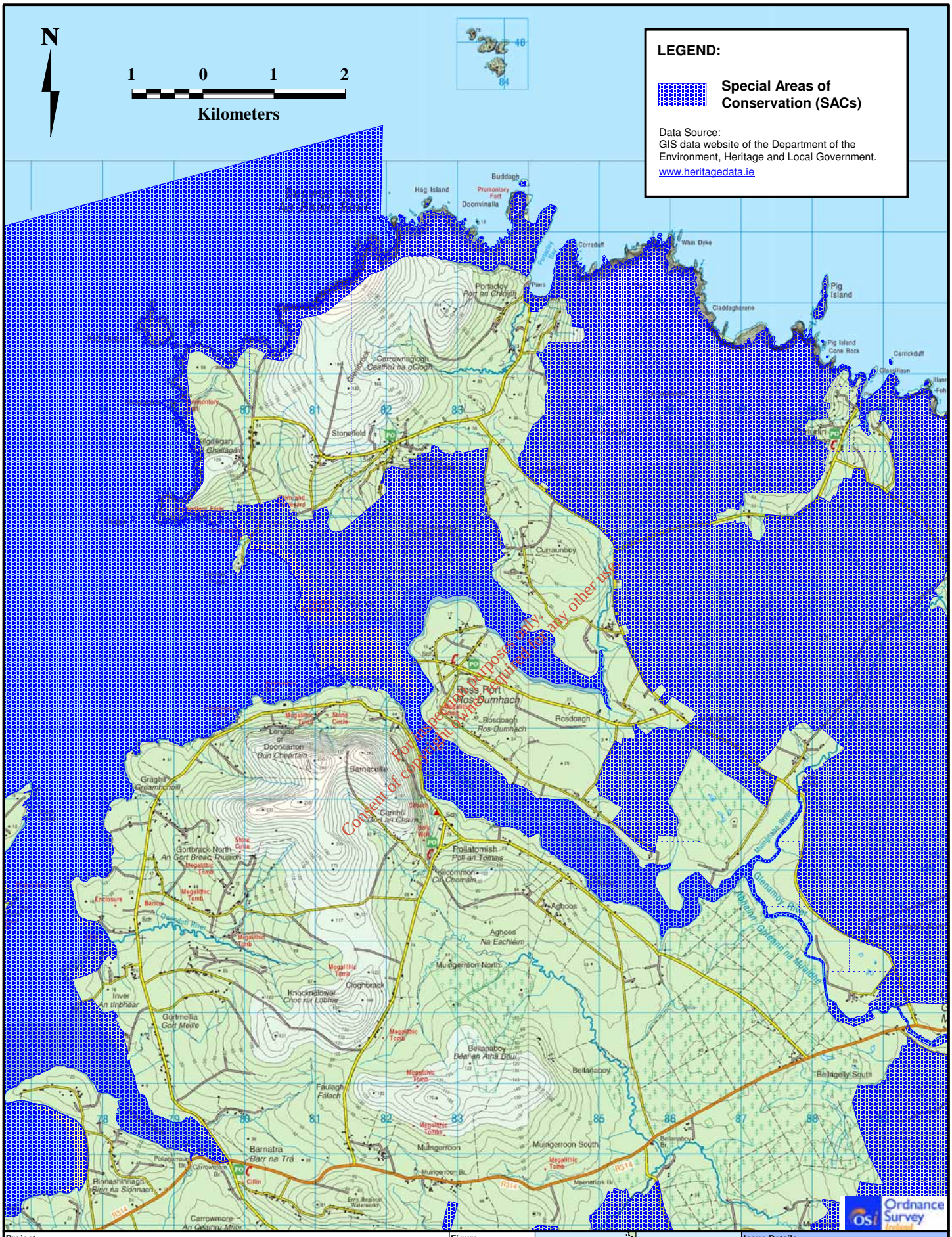
The Wildlife and Amendment Acts, 1976 and 2000, their associated statutory instruments and Natural Habitat Regulations (for Special Areas of Conservation, SACs) are implemented and controlled by the National Parks and Wildlife Service (NPWS) of the Department of the Environment, Heritage and Local Government (DoEHLG). NPWS is also responsible for the designation of sites.

Special Areas of Conservation (SACs)

The Natural Habitat Regulations, 1997 and (Amendment) Regulations, 2005, enabled the designation of candidate Special Areas of Conservation (cSACs) under Article 3 of the Directive 92/43/EEC of 21st May 1992 on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive), as part of the Natura 2000 network. This network comprises Annex I habitats - "natural habitat types of community interest whose conservation requires the designation of Special Areas of Conservation" and the habitats of Annex II species - "animal and plant species of community interest whose conservation requires the designation of Special Areas of Conservation". In addition, the Directive states that: "The Natura 2000 network shall include the special protection areas classified by the Member States pursuant to Directive 79/409/EEC."

Special Protection Areas (SPAs)

Special Protection Areas (SPAs) are designated under Directive 79/409/EEC of 2nd April 1979 on the conservation of wild birds (the Birds Directive). Under the Directive, Ireland is obliged to protect the habitats of birds, which are vulnerable to habitat change or to low population numbers. Aspects of habitat protection are in the context of pollution, deterioration of habitat and disturbance. This Directive is implemented in Ireland under Statutory Instrument (1985) and is encompassed by the Wildlife and Amendment Acts, 1976 and 2000. Once designated, measures will be taken to preserve, maintain and restore biodiversity and an area necessary for birds listed in Annex I of the Directive.



Project	*Corrib Onshore Pipeline*	**Figure**	2.1
Title	**Special Areas of Conservation (SACs)**		

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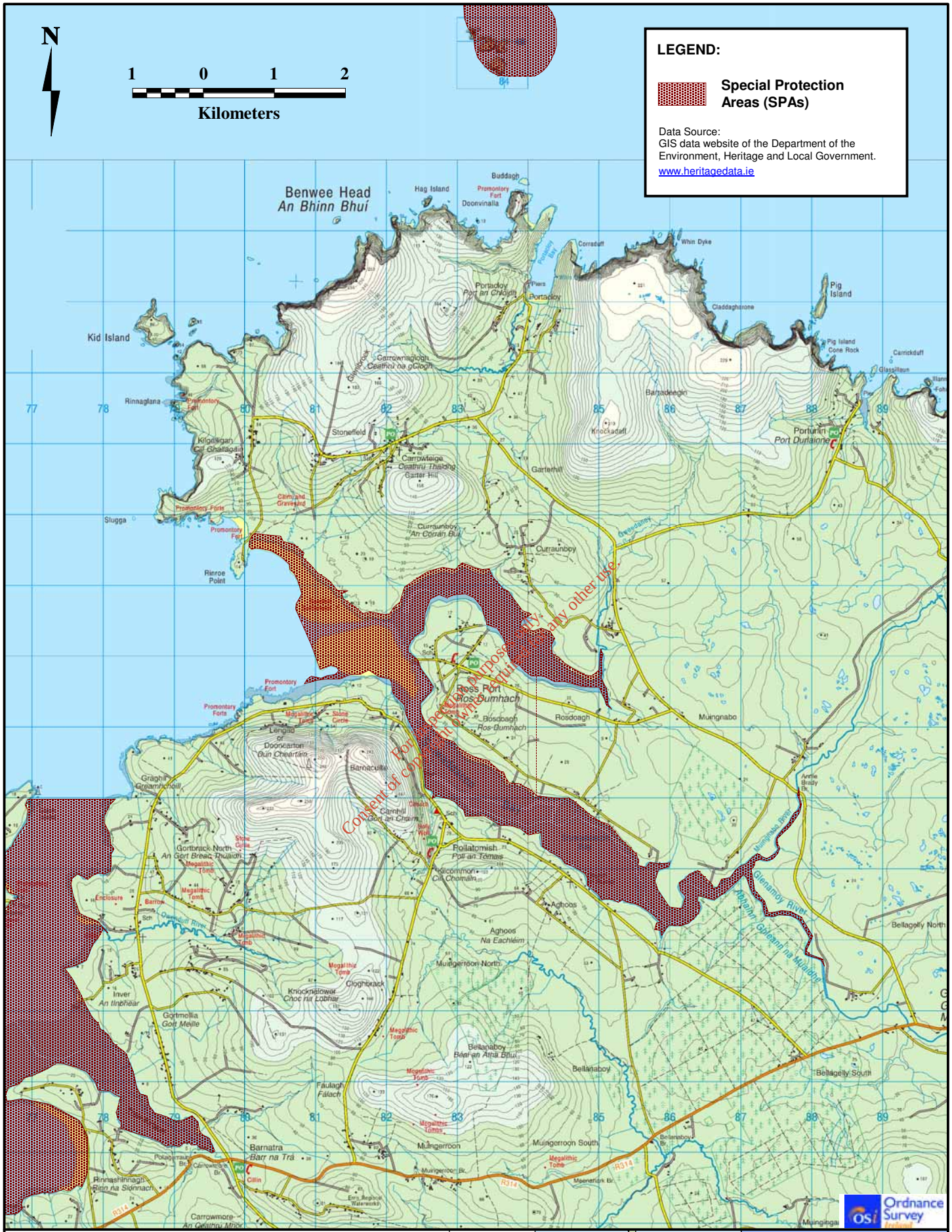

Project	*Corrib Onshore Pipeline*	**Figure**	2.2
Title	**Special Protection Areas (SPAs)**		

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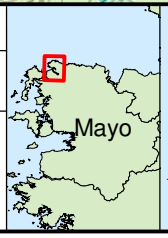

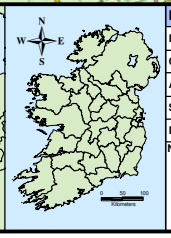

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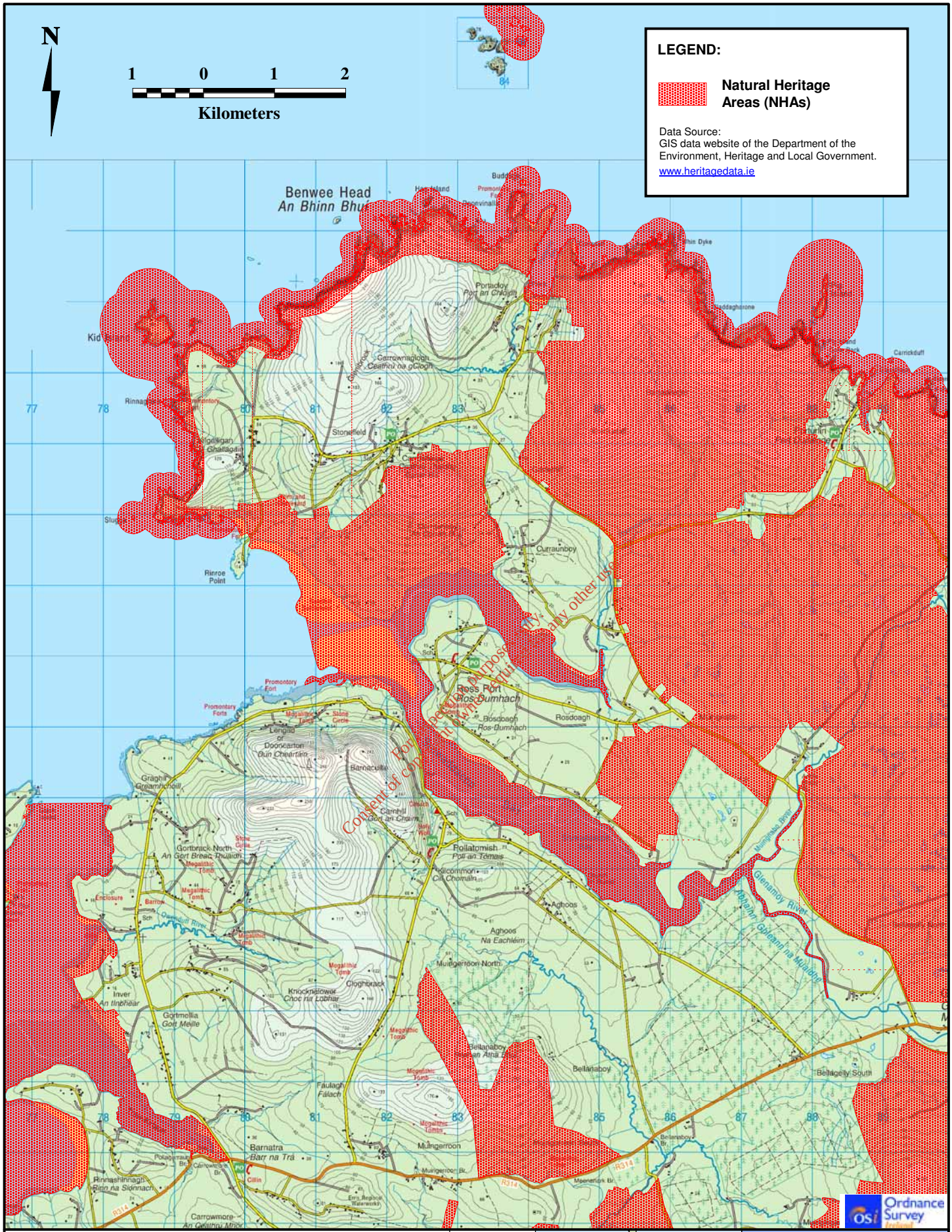

Project	*Corrib Onshore Pipeline*	**Figure**	2.3
Title	**Natural Heritage Areas (NHAs)**		

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Natural Heritage Areas (NHAs)

Natural Heritage Areas are designated under the Wildlife (Amendment) Act 2000 whereby it is considered an area is worthy of conservation for one or more species, communities, habitats, landforms or geological or geomorphological features, or for its diversity of natural attributes.

Ramsar sites

"Ramsar" refers to an international convention in relation to wetland sites which was ratified by Ireland in 1985. The Convention has its roots in the protection of wetland wildfowl and for many sites it is species-associated. More recently Ramsar has taken on the more, all-encompassing, wetland habitat approach which - in the context of the EU - fall in line with site protection under the Habitats Directive. Regarding the protection of Ramsar sites – international conventions such as Ramsar are effectively recommendations to countries to implement certain protection measures. In comparison with national and EU legislation these conventions might be thought of as "soft" legislation. (Way et al 1993)

The Ramsar convention has no statutory basis itself, it is operated through either EU or national legislation. In this case the EU Birds Directive and EU Habitats Directive through the Wildlife and Amendments Acts (1976 and 2000).

There is a reporting requirement by the statutory agency – in this case NPWS, DoEHLG:

- Ramsar requires that "wise –use" is carried out throughout. Part of this is the EIS/EIA process.
- If at the end of that process it was considered that there would be significant damage then NPWS has to report same to the Ramsar Convention Bureau.
- Essentially Ramsar is in line with the concept of sustainable development rather than absolute protection.

The following designations lie within the study area:

Broadhaven Bay SAC 472

Broadhaven Bay is a shallow tidal inlet; its estuarine habitats are important feeding grounds for over-wintering wildfowl. In addition to its special importance for its wintering wildfowl populations, the bay forms an integral part of the Glenamoy River Salmonid fishery. Large areas of this complex site are intact and of great ecological value. However, parts of this SAC have been subject to damaging land use practices over a long period of time.

Broadhaven Bay SAC is part of the Blacksod Bay and Broadhaven Ramsar site (no.844 - area 683 ha) which was designated 11th June 1996. The site was the Blacksod/Broadhaven SPA prior to the site review during the 1990s and SAC designations. Sections of these sites are now incorporated into three SACs, namely Mullet/Blacksod Complex, Broadhaven Bay SAC and the Glenamoy Bog Complex SAC.

Glenamoy Bog Complex SAC 500

A large and complex site, comprising a wide range of habitats including blanket bog and coastal habitats. The latter includes the Garter Hill machair, a priority habitat under Annex I of the E.U. Habitats Directive. Lowland atlantic blanket bog dominates the site.within this complex and are internationally important in terms of their vegetation composition (EU Habitats Directive). Some areas

of SAC blanket bog are of lesser quality in habitat terms, as a result of afforestation, turf cutting - manual and mechanical - resulting in drainage and edge effects. The more floristically important and intact areas tend to occur further to the north east in the less accessible area of the complex. *Petaphyllum ralfsii*, a bryophyte listed on the Flora Protection Order (SI 94 of 1999) is present at Garter Hill. This SAC also supports Annex species of birds (EU Birds Directive) and mammals and nationally important populations of other sea birds. This site also includes Sruwaddacon Bay and the small bay north of Rossport; both are included within the SPA.

Sruwaddacon Bay

Sruwaddacon Bay is an SPA and is part of the Glenamoy Bog Complex SAC 500. It is a shallow tidal inlet off Broadhaven Bay Marine SAC 472 and is of special importance for its wintering wildfowl populations, which feed on the intertidal sand/mud flats. It forms an integral part of the Glenamoy River salmonid fishery.

Pollatomish Bog NHA 1548

Pollatomish Bog is situated to the north of the R314 Glenamoy - Belmullet road, west of Bellanboy Bridge. “It is an area of uniform blanket bog with a steep slope reaching up to 100 m in the centre of the site, is a typical Atlantic Blanket Bog area - it is quite wet with species-rich moss (*Sphagnum spp*.) lawns. Tussocks with Deergrass (*Scirpus caespitosus*) and Bog-myrtle (*Myrica gale*) are common, while pools with Bog Bean (*Menyanthes trifolium*), Bladdwort (*Ultricularia minor*) and mosses (*Sphagnum spp.)* are also found. Further up the slopes the habitat becomes drier and heathy, with Ling Heather (Calluna vulgaris) becoming dominant” (from NPWS site synopsis).

The site is grazed by sheep and cattle and has been drained in places. Turf cutting has been carried on peripherally in the past. Now somewhat diminished in size, it remains as a good example of atlantic blanket bog.

A site synopsis for each of the above is included in **Appendix C.**

2.1.5 Fish, Fisheries and Aquaculture

Broadhaven Bay is of importance to the local economy as fishing grounds. Salmon and sea trout are known to migrate through the Glenamoy and Muingnabo Rivers (with some licensed netting occurring in the Sruwaddacon, drift net fishing for salmon is now banned), while lamprey and eel are also known to occur in rivers in the area. The Central Fisheries Board has identified Curraunboy Bay as a nursery area for thornback ray, flatfish and potentially turbot. In terms of aquaculture, it is believed that two licensed shellfish sites exist in Sruwaddacon Bay.

2.1.6 Landscape

The study area is located toward the northern reaches of a large inland area of predominantly flat to gently undulating low-lying and partly modified blanket bog. This landscape is notably enclosed to the south and west by prominent uplands and the open and exposed nature of the lowland landscape is interrupted by prominent and extensive coniferous plantations and occasional lines of trees.

Within plantation areas, the roads are strongly enclosed; otherwise, the roads are generally open, not being defined by walls or hedges, thus enabling long-range views occasionally restricted by landform or by vegetation.

2.1.7 Soils & Geology

The General Soil Map of Ireland (National Soil Survey) indicated that the onshore area is almost entirely covered by Blanket Bog. Estuarine deposits are common in thin strips along the shoreline, and typically comprise sand and finer grained material at the surface, with coarser deposits at depth. Minor areas of aeolian deposits (wind-blown) are present at the western edge of Sruwaddacon Bay. Along river valleys, alluvial deposits comprising mixed granular material (sand to boulder sized particles) may be found.

In a few isolated areas, soil derived from the underlying till is present (mainly along the northern shore of Sruwaddacon Bay), with an expected depth of 1m to 2m. Below the high water mark, peat and soils are absent. Typically, the superficial deposits comprise sand and gravel. Schists and limestones from the Appin Group are present closer to the Gas Terminal site, with the Inver Schist Formation underlying the Gas Terminal itself.

Minor rock types within the area include intrusive igneous dykes (generally aligned east-west), which may be much harder than surrounding bedrock. Structurally, the geology of the area dips 60 to 80 degrees towards the south, with several smaller deformation events causing smaller scale folding. North–south trending faults are present in the area, several of which can be traced on both sides of the Sruwaddacon Bay.

2.1.8 Cultural Heritage

The known archaeological resources within the study area are dated from:

The Prehistoric Period

- Pre-Bog field system
- Megalithic sites
- Hut Sites/ Enclosure Site
- Stone Circle
- Hill fort/ Promontory fort

Early Christian Period

- Rath/ ringfort/ cashel/ stone fort
- Crannog

Medieval Period

- Castle- defended structure
- Ecclesiastical sites

Post Medieval Period

- Children's Burial Ground
- House Sites/ Buildings

2.2 CONSTRUCTION METHODS

The type of construction methods chosen to construct the pipeline will play a key role in determining the final pipeline route particularly in areas of peat and marine crossings. The construction phase of the proposed gas pipeline and associated installations is likely to cause the greatest potential for

impact on the physical environment. However, the construction phase will be limited and therefore the risk of any potential impact will only be on a temporary basis.

Appendix A provides details of standard pipeline construction for crossing improved agricultural land and the following specialised techniques that may need to be adopted for either environmental or practical reasons.

- Construction Methods through Peatlands
- Trenchless Construction Techniques
- Trenching in Marine Areas

Please note that this methodology is intended as a guide only and that the final methods to be implemented will be developed by the environmental specialists and RPS technical team, and agreed in advance with National Parks and Wildlife Service (NPWS), the North Western Regional Fisheries Board (NWRFB) and any other relevant body to avoid any impact on the environment.

Aerial view of Sruwaddacon Bay and Rossport Area

3 EIA PROCESS

Environmental Impact Assessment is a process for anticipating the effects on the environment caused by a development. Several interacting steps typify the early stages of an EIA process, which culminates in the production of an EIS (see Figure 3.1. The first step is to determine if an EIA is required. This is referred to as Screening (see section 3.1). If it is determined that an EIA is required the next step is to scope the content of the EIA. Scoping (see section 3.2) identifies the key project specific issues that are likely to be significantly impacted during the EIA and outlines possible alternative approaches to the project.

Following on from scoping, the EIA process includes a baseline assessment to determine the status of the existing environment, impact prediction and evaluation, and determining appropriate mitigation measures, including monitoring and reinstatement. In this instance the EIS is then prepared for submission as part of the application to ABP and DCMNR. The following sections describe the initial stages of the EIA process. Figure 3.1 illustrates the EIA process in detail.

3.1 SCREENING - REQUIREMENT FOR AN EIA

Environmental Impact Assessment was introduced through the European Directive 85/337/EEC as amended by 97/11/EC. These regulations relate to the assessment of the effects of certain public and private projects on the environment. The regulations specify the developments for which EIA will be required and the information, which must be provided in an EIS prepared in connection with the proposed development.

The European Directive is implemented in Ireland through S.I. No. 93 of 1999 entitled *European Communities (Environmental Impact Assessment)(Amendment) Regulations, 1999.* Projects requiring EIA are listed in Part I of the First Schedule of S.I No. 93 and include "*pipelines for the transport of gas, oil or chemicals with a diameter of more than 800mm (32") **and** a length of more than 40km*". The proposed pipeline is excluded from this category, as although the entire pipeline (onshore & offshore) is greater than 40km, its diameter is less than the specified 800mm diameter.

Article 4(2) of the Directive states that '*other projects*' may require the completion of an Environmental Impact Statement. Whether in the case of '*other projects'* such a report is necessary or not is decided on a case-by-case basis or on thresholds set by the Member States. In the case of Ireland, S.I. No. 93 of 1999 sets thresholds, which determine the need for an EIS. Classes of '*other projects'* are listed in Part II of S.I No. 93 of 1999 which includes *"gas pipelines and associated installations not included in Part I of this Schedule, where the design pressure would exceed 16 bar **and** the length of new pipeline would exceed 40 kilometres".* Therefore under Part II, the entire pipeline is subject to an EIS.

These provisions of the Directive have also been incorporated into the Planning and Development Code in Schedule 5 of the Planning and Development Regulations 2001 (SI No. 600 of 2001) as amended.

In addition under the Planning and Development (Strategic Infrastructure) Act 2006 and EIS is required to accompany an application for strategic infrastructure development, which include pipelines. For further detail refer to Section 3.1.1 below.

3.1.1 The Planning and Development (Strategic Infrastructure) Act 2006 (SIA)

This Act is titled in part "An Act to provide in the interests of the common good, for the making directly to An Bord Pleanala of applications for planning permission in respect of certain proposed developments of strategic importance to the State: to make provision for the expeditious determination

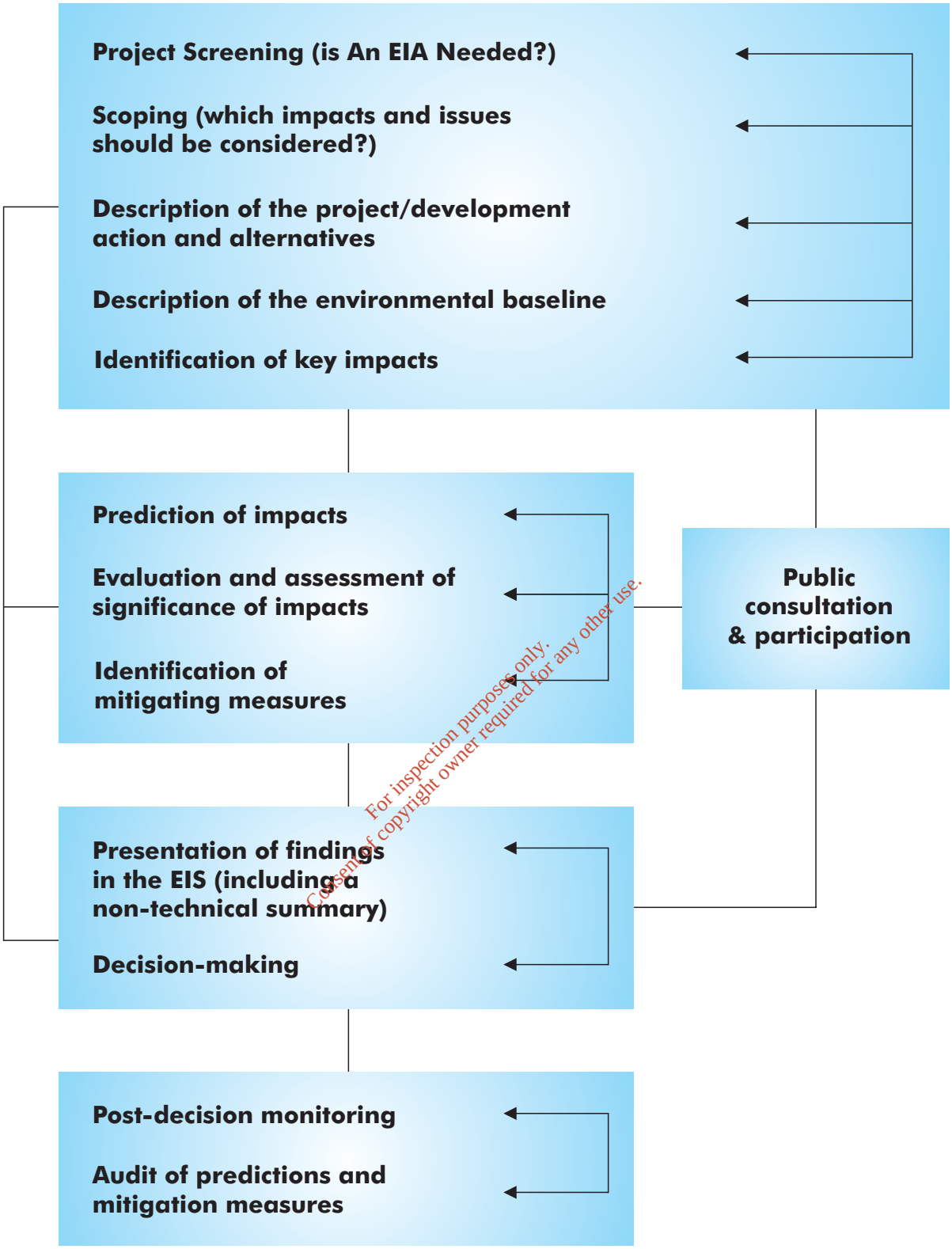

Figure 3.1 Important Steps in the EIA Process

of such applications, applications for certain other types of consent or approval and applications for planning permissions generally….". The Act commenced in its entirety on 31st January 2006, including provisions relevant to the proposed pipeline project.

Section 4 of the SIA amends Part XI of the Planning & Development Act 2000 (the Principal Act) by inserting new sections after Section 182 of the 2000 Act, (Sections 182A-182E inclusive) which relate to Provision of Electricity Transmission and Gas Infrastructure. Therefore the provisions of Section 4 of the SIA apply to this proposal.

Section 182C of the SIA provides that, where a person (the "undertaker") intends to carry out a Strategic Gas Infrastructure Development, the undertaker shall prepare an application and an EIS, and shall apply to the Board for approval of the development (under S.182D of the Act). There is no latitude for approval of such development without prior compliance with the provisions of this part of the Act (and with associated Part 18 of the Planning and Development Regulations 2006). A "Strategic Gas Infrastructure Development" is defined in Section 6 of the SIA as "any proposed development comprising or for the purposes of a strategic downstream gas pipeline or a strategic upstream gas pipeline, and associated terminals, buildings and installations, whether above or below ground, including any associated discharge pipe". This definition clearly incorporates all development associated with the pipeline project, including, for example, the beach valve station and the associated umbilical elements, whether in a single, or separate, pipelines, trenches etc.

3.2 SCOPING

Scoping is now being carried out as a decision has been made that an EIA is required in respect of the project (the screening process). Scoping is an integral part of the EIA process, the aim of which is to identify matters that should be covered in the EIS.

The process of scoping will involve assessing the project's possible impacts and the alternatives that can be addressed, and deciding which impacts are likely and significant. An initial scoping of possible impacts has identified those impacts thought to be potentially significant, those thought to be not significant and those whose significance is unclear. Those considered to be not significant are eliminated; those in the uncertain category are added to the initial category of other potentially significant impacts. This refining of focus onto the most potentially significant impacts continues throughout the EIA process. Figure 3.2 identifies the order of Scoping within the EIS process and Figure 3.1 expands on the many different steps entailed in the Scoping procedure.

It must however be emphasised that Scoping for an EIS is an on-going process, which continues throughout the EIA process and through the design, construction and monitoring phases. As such the Scoping Report is never final but an ever changing document. This allows the flexibility to adapt to any new issues, for example the discovery of additional impacts arising from detailed baseline studies resulting in the investigation of new impacts, alternatives and mitigation measures as necessary.

The aim of this Scoping Report is to identify such matters as:

- Obligations by law – Directives & Regulations
- Potential impacts and those which may be significant
- Types of alternatives to be explored including mitigation measures
- Consultations

This Scoping Report addresses these issues by identifying:

- Legislative requirements (Section 3)

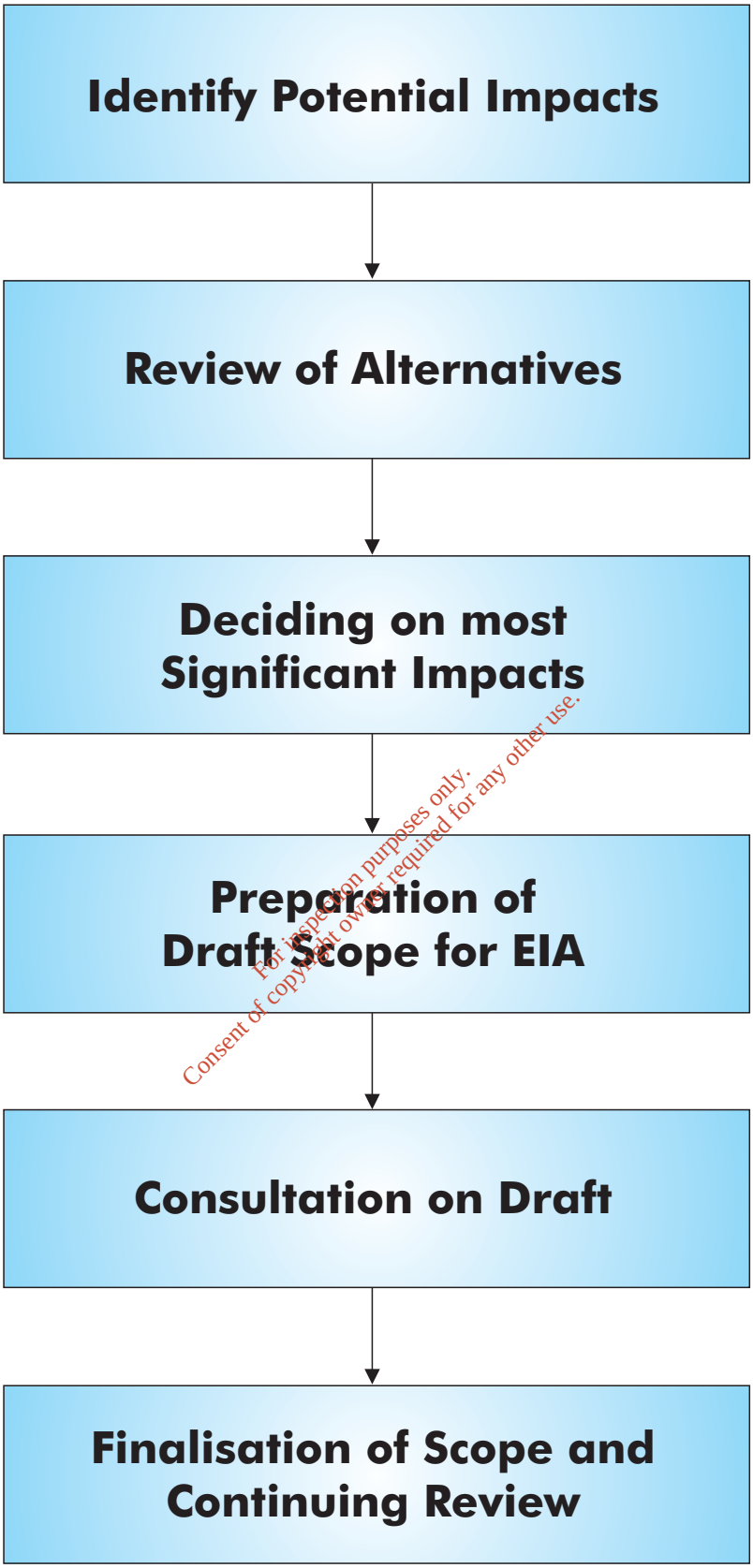

Figure 3.2 EIS Scoping Process

- Consultations to be made (Section 3.3)
- Baseline studies and surveys to be undertaken (Section 4)
- The main alternatives to be studied by the developer and an indication of the main reasons for his choice, taking into account the environmental effects (Section 4.7)
- Programme (Section 5), resources and expertise required for the EIS

This scoping document has been written with reference to the EPA Document entitled '*Guidelines on the Information to be Contained in Environmental Impact Statements*' (March 2002) which provides guidelines for the preparation of an EIS. This document also outlines potential environmental impacts which may be associated with gas pipeline construction projects. Reference has also been made to *Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)* (September 2003), which provides specific scoping guidance for 33 types of project of which Project Type 20 includes 'industrial installations and pipelines for the transport of gas [etc]'. This document has also been prepared with reference to the EU document on scoping. *European Commission Guidance on EIA: Scoping.*

3.3 CONSULTATION

Consultation is an essential part of the Environmental Impact Assessment process. Consultation with the public, statutory bodies and interest groups provides an opportunity to:

- Identify concerns and measures about the project and uses these to inform the preparation of the EIS;
- Incorporate mitigating measures where possible into the design of the project in early stages;
- Take into consideration the expertise and knowledge of local communities, experts and interest groups;
- Encourage participation in decisions yet to be made;
- Take into consideration concerns during the decision making process and make the decision and conditions on the decision accordingly;
- Ensure members of the community are fully informed with up to date information about all aspects of the development throughout the full duration of the project;

This scoping document provides an opportunity to identify what scoping should be carried out during the environmental impact assessment and how it should be carried out. Consultation is also used to refine and inform the contents of the scoping document. Where possible feedback from consultation will be used to inform the scoping and EIS process, and will be incorporated into final design where appropriate.

This section outlines the statutory requirements for consultation, as well as non-statutory consultation to be undertaken during this EIA.

3.3.1 Statutory Consultation

Council Directive 97/11/EC formally introduced scoping and the option of requesting the competent authority for an opinion on the information to be contained in the EIS before the EIS is submitted. In this case a written request will be submitted to both ABP and the DCMNR.

Section 182(C)(4)(b) of the Strategic Infrastructure Act requires that when submitting an application for strategic infrastructure development, the applicant must also submit it to various prescribed bodies. Separately, the Gas Act 1976 (as amended) lists prescribed bodies to whom an application for a gas infrastructure project under Section 40 of that Act must be referred to for consultation. The following are deemed to be the appropriate bodies requiring notification based on the nature and extent of this proposal in this instance.

- Minister for Environment Heritage and Local Government
- Minister for Communications Marine and Natural Resources
- The Environmental Protection Agency
- Mayo County Council
- The National Roads Authority
- An Chomhairle Ealaion
- Bord Fáilte Éireann
- An Taisce
- The National Heritage Council
- North Western Regional Fisheries Board
- Commission for Energy Regulation
- Minister for Transport
- Minister for Agriculture and Food
- National Parks and Wildlife Services, DoEHLG
- West Regional Authority
- Bord Gais
- Office of Public Works
- National Monuments Advisory Council

3.3.2 Non-statutory Consultation

In addition to statutory consultation, it is essential to undertake consultation with other people and organisations that may be affected by the proposal. Consultation carried out prior to the formal application process is an important method of ensuring that all relevant issues are discussed and addressed. Pre-application consultation also helps to avoid possible resulting from requests for additional information and also provides an opportunity for exchange of views at an early stage when there is still flexibility in the design of the development.

Non-statutory consultation will be carried out with members of the public likely to be affected by the proposal and with individuals, groups and organisations that have specific function or interest in aspects of the proposal. It is important to consult with such organisations at an early stage will help to inform them of the proposed application and to seek their input regarding potential environmental impacts and mitigation measures.

Consultations for the proposed development began prior to initiation of the EIS Scoping Report and will continue throughout the EIA process. During the initial stages of this proposal relevant statutory and non-statutory organisations will be contacted as part of the consultation process. The objective of this early consultation exercise was to focus on providing these organisations with the opportunity to identify to the project team those issues pertaining to the proposed development that they considered important and warranting investigation and inclusion in the EIS.

The following non-statutory consultation methods will be used throughout the duration of this development:

- **Open Days** – Introduction to Project Team, Presentation of Route Corridor Options, Consultation and information on Route Corridor Options, Presentation of Emerging Preferred Routes
- **Workshop** – Route Corridor Selection Criteria
- **Direct Meetings** - with various relevant individuals, groups, bodies and organisations throughout the application process-
- **Local RPS Office** in Belmullet open to the public from 9-5pm with RPS project staff available for face to face meetings and to provide information, brochures etc. The office will be operational throughout the duration of this development
- **Lo call telephone line**: 097 20720 (20721)
- **Email address**: routeinfo@rpsgroup.ie
- **Website** www.corribgas.ie

The results of all consultation will be considered throughout the EIA process and will be compiled into a separate report, which will be submitted as part of the application process.

Open Day No. 1 (Route Selection), Belmullet, February 2007

4 POTENTIAL ENVIRONMENTAL IMPACTS

The objective of this section is to scope the likely environment impacts. The first step involves the examination of current legislation and guidance, which requires impacts on the following factors to be addressed:

- Human beings
- Fauna and flora
- Soil (geology), water, climatic factors and the landscape
- Material assets, including the architectural and archaeological heritage, and the cultural heritage
- The inter-relationship between the above factors

Furthermore, the likely significant effects (including direct, indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative) of each stage of the proposed pipeline on the environment resulting from the following, will be addressed:

- the construction, operation and decommissioning of the proposed development,
- the potential use or loss of natural resources,
- the potential emission of pollutants, the creation of nuisances and waste.

Having identified the legislative obligations the next step is to note the different project stages and activities for the proposed development i.e. construction and reinstatement phases, operation and decommissioning. Impacts can be identified by considering (1) all aspects of the project (2) the receiving environment and (3) systematically identifying the potential for interactions between them.

At this stage of the project development, no routes have been selected. A study area has been identified from which route corridors will first be selected and assessed prior to selecting a preferred route.

Early consultation with both statutory and non-statutory consultees including the public will provide important information for consideration in the onshore pipeline route selection process. As discussed in Section 2 the route selection will be divided into three distinct phases. It is anticipated that the scoping of the EIS will be refined after each of these phases.

The existing baseline information compiled during previous studies will be reviewed and considered where appropriate. However, as the pipeline route selection will consider a larger study area, specific details are not yet available to scope each of the environmental issues. Once route corridor options have been selected at the end of phase one of the route selection process, the scope for each environmental assessment will be developed to ensure baseline conditions are identified. The scoping report will then be revised to take these into consideration.

4.1 POTENTIAL SIGNIFICANT IMPACTS

Once a list of potential environmental impacts has been identified it is necessary to identify those potential impacts considered to be most likely to occur and their level of significance. This ensures that the EIA studies are focused on obtaining all relevant information required for the EIA process. In the context of this document a significant impact is considered to be one which is likely to be important in the decision-making process and which should be addressed in the Environmental Impact Statement. The European Commission document *Environmental Impact Assessment, Guidance on Scoping*, June 2001 contains a checklist for significance. Matters to be considered should include but are not limited to:

Public:

Level of public concern, will many people be effected

Impacts:

Duration, magnitude, mitigation potential, area affected, probability of occurrence, and likelihood of impacts outside of the study area.

Environment:

Value of affected area, sensitivity of area, sensitivity of people, existing impacts.

Standards and legislation:

Consistency with environmental standards, planning policy and environmental policy. Will there be any breach of standards?

Although the potential impacts may vary depending on route selection, at this stage, it is considered likely that the most significant potential impacts associated with the pipeline development would be of a temporary nature and experienced only during the construction stage (potential air quality issues, noise disturbance, traffic disruption, visual impact). There may be a temporary to short term loss of land for production. However, residual issues may include planning restrictions within the wayleave and a potential visual impact from the landfall facilities. It is anticipated that there will be no significant impacts during the operational phase except for traffic carrying out routine maintenance surveys.

At this stage, attention to the potential significant impacts on the following aspects need to be addressed:

- Potential Community Issues.
- Construction in or adjacent to any designated areas of conservation (SAC, SPA, NHA), including indirect impacts; and potentially other habitats of conservation value discovered during the route selection process. Potential effects on habitats, protected species, seasonal changes, migratory species & feeding grounds will be examined in the baseline assessment to ensure potential impacts can be addressed adequately.
- Potential effects on the hydrology of sensitive blanket bog habitats.

- Water quality with respect to the crossing of estuaries, rivers and streams especially those identified to support populations of species of conservation importance and/or spawning/nursing areas

- Potential changes in land use and impacts on agricultural holdings.

A desk-based study will initially be conducted during phase 1 of the route selection process (See Section 2). This study will be used to further define the scope of the environmental assessment to deal with the most significant issues and identify areas where field surveys will be required. The desk study will examine all existing published data relevant to the above environmental topics and will include consultation with all relevant consultees (NPWS, NWRFB, etc). Specialists in the following areas will undertake comprehensive desk studies which will assist with the selection of route corridors and inform the surveys required for phases 2 and 3 of the route selection process:

- Planning & Community Issues

- Flora & Fauna – Marine, Estuarine, Peatlands, Terrestrial & freshwater including birds, mammals and fisheries.

- Archaeology & Cultural Heritage – Terrestrial & Underwater

- Landscape & Visual Assessment

- Geology & Hydrogeology

All attempts will be made in the initial route selection stage to avoid known constraints such as population centres, environmentally sensitive areas, archaeological sites etc. Where it is not possible to avoid these constraints every effort will be made to select a route, which will minimise potential impact.

The potential and significant impacts can be organised into the environmental topics outlined below. These topics may change as the EIA process continues. Specialists will assess the potential impacts and consider mitigation measures for each topic in the three phases of the development (construction, operation & decommissioning phase). The scope and extent of each survey will be developed

4.2 HUMAN ENVIRONMENT

4.2.1 Human Beings

4.2.1.1 Land Use and Agriculture

Proposed scope for Environmental Assessment

The area of the proposed development consists of improved grassland (mostly in the form of reclaimed blanket bog) used primarily for sheep production, forestry plantations (on peat) and areas of intact and modified lowland Atlantic blanket bog, such as parts of the Glenamoy Bog complex. Many of the bog areas have been modified by human activity, such as turf cutting or draining.

This development is likely to impact on the current landuses in the area. The main potential temporary significant impact is likely to be on farming. This will primarily be due to the removal of land from production during construction of the pipeline and the reinstatement of the working strip. It is likely that the land will be out of production for at least 12 months and some of the land may not be ready for grazing for a period of 15 to 18 months from the date of entry on to the lands by the contractors laying the pipeline.

In addition to the lands within the working strip, there may be some small parcels of land between the working strip and existing field boundaries that will not be suitable for farming. These areas will also be removed from production during construction.

It is proposed that the landuse assessment will be undertaken in three phases.

1. Desk top – This phase will examine the following;
    - Latest aerial photography,
    - OSI 2,500 mapping, and
    - CORINE landuse database.
2. Many of the current landuses can be identified from the aerial photography and CORINE landuse database. This survey will indicate likely landuses that can be confirmed in the walkover survey conducted in phase 2.
3. It is proposed to undertake a walkover survey of the scheme. Properly qualified and experienced personnel will conduct this walkover. This walkover survey will identify the landuses potentially impacted by the proposed development.

Compilation of a Landuse Impact Assessment Report, which will contain the following:

- The landuses affected by the proposed development,
- The likely significant impacts (construction and operation), and
- Propose mitigation measures.

The NRA code of practice Guide to Process and Code of Practice for National Road Project Planning and Acquisition of Property for National Roads will be adhered to with respect to the prevention of the spread animal disease.

4.2.1.2 Noise and Vibration

Proposed scope for Environmental Assessment

A preliminary site visit to assess the number and location of potential noise sensitive receptors located in the general study area will be undertaken. During the site visit the nature of the existing noise environment within the study area will be assessed. The primary objective of the site visits will be to identify existing potential noise sensitive receptors in the area, particularly any 'new' sensitive receptors that may not be indicated on Ordnance Survey Mapping of the area. The characteristics of

the prevailing noise climate will also be noted during the site visits. Noise monitoring however will not be undertaken at this stage of the project.

The potential noise impact of the proposed development will be assessed taking account of the *Environmental Impact Assessment Regulations, 1989 – 2001*, and the *EPA Guidelines on the Information to be contained in Environmental Impact Statements, March 2002*, in addition to *World Health Organisation Guidelines* where appropriate. The potential noise impact of the proposed development will also be considered with regard to the standard guidance document *BS4142: 1997, Method for Rating Industrial Noise affecting Mixed Residential and Industrial Areas*. Where significant noise or vibration impacts are identified, mitigation will be proposed in terms of screening of plant and/or machinery or recommendations for revision to the layout of construction facilities, in order to reduce, and where possible, eliminate potential negative noise impacts on noise sensitive receptors, as appropriate.

4.2.1.3 Traffic Impact

Proposed Scope for Environmental Assessment

The Traffic Impact assessment will:

- Describe the existing environment in relation to roads, traffic and transport
- Describe the proposed project in relation to construction and operational stage as it relates to roads, traffic and transport
- Assess the impacts of the project in relation to roads, traffic and transport
- Propose mitigating measures in relation to roads, traffic and transport

The methodology to be employed will primarily comprise analysis of existing documentation including the Mayo County Development Plan and subsidiary plans, Local Area Plans etc, and the NRA Road Traffic Growth Forecasts 2002-2040 supported by a site visit(s). This will provide a report, which outlines the following:

- Collection of quantifiable data (traffic flow data, cross section data, HGV data)
- Description of Road Network (hierarchy, function, condition, cross-section, volumes, HGV%)
- Description of Proposed Development (Activities, operations, trip generation, work hours,)
- Description of Construction Stage impacts (Work hours, trip generation, volume, traffic routeing)
- Description of future impacts (with focus on construction impacts, identification of potential road condition and pavement problems as impacts are presumed to be minimal for operational phase)

- Description of mitigation measures (with focus on construction mitigation - operational hours limitations, routeing of traffic, improvement of road pavement and cross, monitoring, submission on traffic management plans to Local Authority for approval)

The following Standards will be taken into account:

- Institute of Highways and Transportation (IHT) Traffic Impact Assessment Guidelines (1994) and subsequent updates
- NRA Draft Traffic and Transportation Impact Assessment Guidelines (2005)
- NRA Design Manual For Roads and Bridges
- Traffic Management Guidelines DEHLG/DOT/DTO (2003)

4.2.1.4 Socio-Economic Assessment

Proposed Scope for Environmental Assessment

This assessment will consider the joint issues of Population and Employment, in order to provide a robust demographic analysis of the receiving environment. The scope of this study will consider the statistical demographic profile of the study area, including population numbers, population change, age profile, levels of employment and unemployment, and social class (which includes a study of the type of employment occurring). This builds up a clear profile of the receiving human environment.

The methodology to be employed will primarily comprise analysis of the latest Census information of the Central Statistics Office. However, it will also be informed by reference to the latest Ordnance Survey and other map data, as well as local knowledge and detailed visual and associated survey along the study route.

4.2.1.5 Community Issues

Proposed Scope for Environmental Assessment

The initial scope of this project suggests that the community can be identified in three constituent parts – the resident community, the working community and the visiting community. Whilst there is some overlap with the Population and Employment issues addressed above, this assessment also explores other issues, possibly more intangible which make up the community – including facilities, but also psychological – the sense, understanding and value of the place to the people who reside, work or visit the area.

Having such a scope, this assessment is inherently more qualitative, and will require a methodology which includes face to face contact and survey with the identified communities along the study route. This will also include primarily visual survey work carried out throughout the summer season, when it is expected that visitors are most likely to stay, and travel in the area. The methodology will include a detailed analysis of the potential communities along the route, and consultation with local residents, workers, and tourism and employment bodies.

4.2.1.6 Tourism

Proposed scope for Environmental Assessment

The receiving environment of the wider study area comprises a long-established tourism area, particularly based upon its natural environment. The EIS will identify the key elements of the tourism product within this area, including centres of accommodation, types, value and intensity of tourism activity, and tourism routes.

The methodology employed includes reference to the tourism policies of the local and regional plans for the area, and any other tourism information. This will be informed by appropriate sources including both Mayo County Council, Bord Fáilte Éireann and the local tourism bodies. This will be both a desk-based exercise, and will also include a detailed visual survey of the area of the project.

4.2.1.7 Cultural Issues

Proposed Scope for Environmental Assessment

This initial scoping identifies a possible impact as being the human cultural environment (as opposed to physical cultural heritage), including the language of the area. It may be the case that this is a community issue as opposed to a separate cultural issue. The EIS will address issues of cultural importance to the human environment, particularly with reference to ways of life, language and lifestyles.

The methodology employed will be primarily by face to face contact with informed individuals, and consultation with relevant bodies.

4.2.1.8 Planning Policy

Proposed Scope for Environmental Assessment

The proposed pipeline project is set in a planning context that encompasses the local, regional and National spheres. It is essential that this context is clearly set out in order to assess whether the project meets the criteria, policies and objectives of this Statutory and Strategic Plans and guidelines.

The methodology employed is essentially a desk-based exercise that examines National, Regional and local planning documents, including the National Development Plan, National Spatial Strategy, Regional Planning Guidelines, and the County Development Plan. It also addresses non-strategic documents and guidelines of essential importance to this specific project, including the Advantica and Cassells report, as equally they inform the planning and development context of this project. This desk-based exercise will be augmented with consultation with relevant bodies and authorities, in particular including Mayo County Council.

The planning context includes the planning history of development along the pipeline, and in particular, any planning applications along the pipeline route that might otherwise obstruct the construction of the project. This section will include a report of a detailed file search at the Planning Registry of Mayo County Council, and relevant associated information obtained from its Planning Section.

This section also addresses the context for the application and in particular the provisions of the Planning and Development (Strategic Infrastructure) Act 2006, and the Gas Act 1976 (as amended). This will include consultation with both An Bord Pleanála, and the Department of Communications,

Marine and Natural Resources. Other relevant consultation and other documents relevant to the planning policy context of the proposed pipeline project will be addressed in this section.

4.2.1.9 Material Assets

Proposed Scope for Environmental Assessment

The issue of economic assets, and in particular, land and property, is of key importance. Whilst land value and compensation is governed by a separate legislative code to planning and development, it is important that the impact of the proposed development on property and property values occurs. The scope of this section includes identifying the various landholdings directly affected by the proposal, the number of landowners involved, and the likely impact (both positive and negative) on those properties. The intent is to provide an objective and analytical (as opposed to subjective or perceptual) indication of the impact that the project may have on property values.

This will be both a desk-based exercise, particularly in the identifying of properties and landowners. It will also include consultation with local and other land and property agents, to gather professional opinions in respect of land and property values.

4.2.1.10 Air Quality & Climate

Proposed Scope for Environmental Assessment

The main impact relating to Air Quality will be during the construction phase of the proposed pipeline and the nuisance impact of dust on the local environment.

Existing air quality sources in the area will be documented, such as major roads, quarries, agriculture and industry. Similarly a review of the receptors in the area will be undertaken. These receptors will not only include residential dwellings but also particularly sensitive receptors such as schools and ecologically sensitive receptors. The proximity of each of the receptors to the sources outlined above will also be noted. The EPA National Air Quality Monitoring Database will be reviewed to determine the current air quality trends in the region.

The main source of potential air pollution is from fugitive dust emissions during the construction phase of the pipeline. As such, the potential of dust impacts from construction activity will also be fully addressed in this section. An air pollution risk assessment will be carried out to determine the potential impact of construction dust on the local environment and this risk assessment will be used to devise a mitigation scheme for the construction phase. A series of industry standard dust mitigation measures that may be employed to mitigate dust to local receptors noted as above will be provided.

Potential impacts to climate from the proposed scheme based on identification of existing climate conditions and potential impacts to macroclimate (greenhouse gas emissions and climate change) will be assessed.

The following standards will be taken into account:

- "Air Quality Standards Regulations 2002", Statutory Instrument 271 of 2002
- "WHO Air Quality Guidelines", 2nd Edition, 2000, World Health Organisation
- "Technical Instructions on Air Quality Control 2002" (TA Luft 2002), VDI

4.2.1.11 Landscape & Visual Assessment

Proposed Scope for Environmental Assessment

The Landscape and Visual Assessment will examine the potential effects of the landfall facilities (see Section 1.2.1) and also the temporary impacts of the construction works within the preferred route corridors on the landscape and visual amenity of the study area. It will be based on relevant and accepted guidance, and will draw on information provided by statutory consultees, current landscape planning policies, County Mayo Landscape Character Assessment and other relevant documentation, together with fieldwork observations.

The visual assessment methodology will be based on the Guidelines for Landscape and Visual Impact Assessment, 2nd edition (The Landscape Institute and Institute of Environmental Assessment 2002). The assessment will also examine the impact of the development from the perspective of different viewpoints.

4.3 NATURAL ENVIRONMENT

4.3.1 Geology & Hydrogeology & Hydrology

Site investigations and geophysical surveys will be completed to identify more accurately the likely geological conditions along the preferred route options. The geophysical survey will assist with determining the requirements for the geotechnical survey and determining sediment thickness within the estuarine area. In this regard, foreshore licence applications were submitted in November 2006 and February 2007 for the geophysical and geotechnical surveys of Sruwaddacon Bay and the bay north of Sruwaddacon Bay and also for Inver Bay, the bay north of Inver Bay and Portacloy Bay to examine potential locations for the landfall.

Proposed scope for Environmental Assessment

The purpose of this assessment will be to gather information on the geological and hydrological conditions within the route corridors, which will be used in determining suitable construction methodologies and reinstatement measures.

The elements to be considered for assessment are:

1. Soils – nature; characteristics;
    - Removal/excavation
    - Soil contamination
    - Potential for subsidence/failure to be addressed by liaison with Geotechnical Engineers
2. Bedrock – nature; characteristics;
    - removal/excavation
    - disposal/re-use
    - geological heritage
3. Aquifer
    - potential for water quality impairment during construction and due to leakage
    - water table lowering

- impact on recharge

4. Surface water hydrology
    - Interference with water courses
    - potential for water quality impairment during construction and due to leakage
    - potential drainage impacts on peatlands

Each element will be assessed as follows:

- Review of available and relevant soils, geological, hydrogeological, hydrological and meteorological data and maps for the study area.

The following standards will be taken into account:

- British Standards Institute. BS5930:1999. Code of Practice for Site Investigations.
- Department of the Environment and Local Government (DoELG), Environment Protection Agency (EPA) and Geological Survey of Ireland (GSI), 1999. Groundwater Protection Schemes.
- Institute of Geologists of Ireland (IGI), September 2002. Geology in Environmental Impact Statements. A Guide

4.3.2 Terrestrial Flora & Fauna

Proposed scope for Environmental Assessment

The purpose of the desk study is to identify the likely significant issues and potential constraints relating to terrestrial flora and fauna including intertidal habitats such as salt marsh; also species of fauna (e.g. birds and otters) which use the intertidal zones for movement and feeding.

The large body of data accumulated during previous Corrib Gas Field Development EIS studies, preconstruction baseline surveys, monitoring surveys etc. will be reviewed. In addition to the studies and surveys undertaken to date, the following sources of information will also be taken into consideration and further information sought in order to bring the knowledge base up to date:

- information available from NPWS on designated sites, individual protected species (plant and animal) sites, blanket bog surveys (Blanket Bog Reports), local knowledge, bird counts etc.
- information from NGOs (e.g. BirdWatch Ireland – recent years Corncrake records and Irish Peatland Conservation Council);

Accumulated knowledge from the previous work in North Mayo by the Project Ecologist will also be reviewed and the taken into consideration where relevant; this includes:

- Vegetation surveys of coastal and blanket bog sites during the National Vegetation Survey 1970 to 1982;

- Input to the Mayo National Park Feasibility Study 1994/95. Neff, J. A. (1998) *Irish Coastal Habitats: a study of impacts on designated conservation areas. Heritage Council,*

In addition to all of the above, any other available data on the presence of and/or potential habitats for, protected plants species; protected species of fauna; and the presence of birds, particularly breeding and migratory species relating to the study area will be collated and assessed.

Walk over surveys

In order to identify any ecological constraints, which might influence route corridor selection, walkover and vantage point surveys of route corridor options will be undertaken by vegetation and fauna specialists to supplement the information gathered during the desk study. Consultations with NPWS will be required throughout this phase.

Once the broad route corridor(s) has been selected more detailed surveys and further consultations will be carried out. Surveys will include:

Walkover habitat surveys: these will be carried out by vegetation experts, initially in accordance with the Heritage Council's habitat survey guidelines. The equivalent JNCC Phase 1 (1990) codes and NVC classifications will also be attributed in the text where it is considered relevant to the assessment process.

- Walkover fauna surveys: a broad route corridor will be assessed for faunal presence (including birds) by experts using standard field survey techniques. Checks will be made for the presence of protected species and those of conservation concern.

- More detailed vegetation/botanical and fauna surveys may be needed in those route sections which are identified as being ecologically sensitive or as having ecological potential. These surveys will be undertaken by the relevant specialists.

- Designated conservation areas will be subject to detailed baseline survey using accepted standard vegetation survey methodology.

Evaluation and Impact Assessment

From the results of the desk study, field surveys and consultations it will be possible to make an informed ecological impact assessment (EcIA) of the proposed route.

Evaluation and impact assessment methodology will be in accordance with:

- the revised EPA Advice Notes on Current Practice (2003);

- EPA Guidelines on the information to be contained in Environmental Impact Statements (2003); and

- in accordance with the scientific principles contained in the Institute of Ecology and Environmental Management's (IEEM) Guidelines for Ecological Impact Assessment (2006).

Habitats and constituent species will be evaluated, the impact magnitude assessed, and recommendations for mitigation will be made with regard to the protection of habitats and species in accordance with best practice and - where appropriate - in consultation with NPWS.

4.3.3 Marine/Estuarine Flora & Fauna

The majority of the estuarine and marine habitat within the study area are designated as SPA and SAC.

The most significant potential impact will be at the construction phase and will be of a temporary nature, where potential may exist for damage or loss of aquatic habitat and contamination of surface waters with suspended solids and other substances associated with the construction process.

Proposed scope for Environmental Assessment

The desk study will collate the existing information on the protected habitats and species (including marine mammals) within the marine environment in the study area along with the fisheries value. Information will be drawn from a number of sources including published works, the existing Environmental Impact Statements, the relevant fisheries boards (North West Regional Fisheries Board (NWRFB) and the Central Fisheries Board (CFB), the National Parks and Wildlife Service (NPWS), and any other groups or organisations that may hold relevant data. The issue of water quality, which is related to the ecology of the area, will also be addressed, using existing data from the Environmental Protection Agency (EPA), local authorities and Western River Basin Management group.

This desk study will allow the formation of a fuller understanding of the general marine environment, which will be valuable for a route corridor selection. It will also help to focus the fieldwork, and to both identify important gaps in information to complete a comprehensive assessment of the area and also to highlight sensitive areas for pipeline construction.

The field survey will assess the potential corridors and route crossings for macrobenthic and physico-chemical properties in addition to a detailed habitat assessment at these locations. In particular, the potential for Annex I habitats, protected under the European Habitats Directive, will be clearly defined.

In order to fully survey the habitat of the study area, the following investigations will be carried out as a minimum:

- Walk-over and inter-tidal mapping of habitat and corresponding biotopes.
- Inter-tidal/sub-tidal sampling and analysis for macrofaunal determination (over 500µm), to include biomass measurements for all inter-tidal sites.
- Physico-chemical analysis of samples to include particle size determination, total organic carbon, heavy and trace metals.

4.3.4 Freshwater Ecology

Again the most significant potential impact will be at the construction phase and of a temporary nature, where potential may exist for damage or loss of aquatic habitat and contamination of surface waters with suspended solids and other substances associated with the construction process.

The desk study will review the freshwater aquatic environment within the study area to identify any rivers/streams/lakes of ecological interest and/or conservation value and fisheries value. It will consider important populations of species protected under the Wildlife Act and/or important populations of Annex II species under the EU Habitats Directive, water quality data and fisheries value (salmonid rivers, amenity fishery value, commercially important fisheries, etc) within the study area. Consideration will also be given to migratory fish within the freshwater and marine environments.

Information will be derived from published and non-published sources and consultation with the following bodies will be required:

- National Parks and Wildlife Service
- North Western Regional Fisheries Board
- Central Fisheries Board (re lamprey and other Annex II fish)
- Marine Institute and DCMNR Fisheries Officers

The scope of the aquatic investigation will be to assess water quality as indicated by invertebrate fauna, salmonid habitat and fish stocks of each waterbody at the point where a route may cross; and to assess salmonid habitat quality for 0.5 km to 1 km downstream depending on stream/river size. A general assessment of the streams/rivers in the context of their catchments will be carried out based on existing data and consultation with the relevant regional fisheries boards and other relevant bodies.

4.4 CULTURAL HERITAGE

Cultural heritage includes aspects of the environment that are valued because of their age, history, beauty or tradition. Cultural heritage issues can include archaeology, architecture, history, landscape and garden design, structures, features and other landmarks.

4.4.1.1 Archaeology

Proposed scope for Environmental Assessment

The archaeological study will identify all recorded archaeological monuments within the study area, including the legal status, if any. The study will collate information from readily available sources that will be used to inform the later stages of the planning process. This work will involve the preparation of an inventory of recorded archaeological sites within the study area. The archaeological desk study will consist of the following elements:

- General overview of the recorded archaeological presence in the area
- Inventory of archaeological and architectural heritage constraints including the shipwreck inventory. This will include the following the Record of monuments and places (RMP), Mayo Development Plan for identification of protected structures, references to bog development within the study area and topographical files from the National Museum of Ireland
- Review of aerial photography
- Review of townland names
- Identification and discussion where possible given the level of known information of significant cultural heritage constraints
- Identification of experts, statutory authorities and organisations for future consultation
- Mapping of all cultural heritage constraints
- Consultation with field archaeologists re: prebog field systems

In addition to the desk study, the route corridor options will require intensive field walking, involving teams of two people each, to establish the distance of known archaeological monuments and their associated features from the pipeline corridor. Such fieldwork also often establishes the presence of new monuments and archaeological features, which will be taken into account when finalising the

pipeline route. Where necessary earthwork surveys, geophysical surveys and probing will also be undertaken. Separate underwater assessments will be undertaken for river/bay crossings in consultation with the Underwater Archaeology Unit.

4.5 INTERACTIONS

For each topic, significant interaction and interdependencies between environmental topics will be outlined in individual environmental topic chapters (for example impacts of water pollution on flora and fauna will be included in the flora and fauna chapter). Care will be taken in the EIS to ensure that all possible interactions are taken into consideration and cross-referenced.

The EIA team (environmental specialists, pipeline route engineers, construction engineers) will meet regularly to ensure that all interactions are addressed.

4.6 CUMULATIVE IMPACTS

Cumulative impact can cover all aspects of the environment. While a single activity may itself result in a minor impact, it may, when combined with other impacts (minor or significant) in the same geographical area, and occurring at the same time, result in a cumulative impact that is collectively significant. This will ensure that the proposed onshore pipeline is assessed as part of the overall Corrib gas infrastructure project rather than as an isolated or piecemeal element of this project.

The cumulative impact section of the EIS will be prepared broadly in accordance with the 'Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions', prepared for the European Commission[8] and the EPA Advice Notes on Current Practice.

4.7 ALTERNATIVES

If a proposed development is believed to have potentially significant impacts on the environment, then an EIA is undertaken for the proposal and ideally for feasible alternatives. The identification of alternatives will continue throughout the entire EIA process whereby other alternatives will be investigated as a means of preventing environmental damage.

The amended Directive 97/11EC "*requires environmental statements to include an outline of the main alternatives studied by the developer, and an indication of the main reasons for the developers choice, taking into account the environmental effects*" and "*a description of the measures envisaged in order to avoid reduce and, if possible, remedy significant adverse effects."* Hence the EIS will contain information on the alternatives to be considered.

Alternatives can take various forms all of which will be examined. A number of broad types of alternatives can be considered: "no action" option, alternative locations, alternative routes, alternative processes or equipment, alternative site layouts, alternative operating condition, construction methodologies, alternative ways of dealing with potential environmental impacts. The main alternatives to be considered as part of the proposed Onshore Pipeline will relate to alternative routes particularly through environmentally sensitive areas encountered along the preferred route, alternative construction methodologies, timing of construction. Alternative routing through or away from designated or environmentally sensitive areas will be thoroughly examined throughout the EIA process.

[8] Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions', prepared for the European Commission (DG X1), May 1999, Office for Official Publications of the European Communities.

5 CONTENT OF ENVIRONMENTAL IMPACT STATEMENT

The Environmental Impact Statement will be prepared in accordance with the requirements of the European Communities (Environmental Impact Assessment)(Amendment) Regulations 1999, the Planning and Development (Strategic Infrastructure) Act 2006, the Gas Acts 1976-2000, the EPA: Guidelines on the Information to be Contained in Environmental Impact Statements and Advice Notes on Current Practice (in the preparation of Environmental Impact Statements). The Advice Notes document provides specific scoping guidance for 33 types of project, of which Project Type 20 includes 'Industrial installations and pipelines for the transport of gas [etc]'.

Appendix B contains a proposed table of contents for the Environmental Impact Statement document. A single EIS will be prepared for the onshore gas pipeline notwithstanding the requirement to submit the application to both An Bord Pleanála (onshore gas pipeline element only) and the DCMNR. The existing EIS 'Corrib Field Development Offshore (Field to Terminal)' (October 2001) will be updated and revised accordingly. Both EISs will cross-reference each other where required.

The EIS will concentrate on the potential environmental impacts of the selected route option, but will address the alternative options considered and their potential impacts.

The information contained in the Environmental Impact Statement will be derived from specialist studies, review of published and unpublished baseline material (where it exists) and consultation with members of the public and key organisations.

The EPA Document, *Guidelines on the Information to be contained in Environmental Impact Statements*, provides guidance for the preparation of an EIS. The guidelines are intended to provide a standard for determining the adequacy of environmental impact statements and also provide a focus for pre-application consultation.

The environmental impact statement will contain a chapter on each of the environmental topics identified in Section 4. Each topic will be assessed and structured as recommended in the EPA's Guidelines as follows:

1. **Methodology** used in the assessment, including any assumptions made

2. **Existing environmental character** of the proposed route/corridor, including assessment of context, character, significance and sensitivity. This section will particularly focus on providing a thorough baseline assessment of the existing environment.

3. Assessment of potential **impacts** as follows

    a. Assessment of the 'do nothing' impact, an explanation of how current trends would impact on material assets if the scheme is not built

    b. Description of impacts from construction and operation of the scheme including the character (positive/negative), magnitude (short term/long term) and duration (temporary/permanent or cumulative) of potential impacts and their consequences on the environment.

    c. Assessment of the worst case scenario if mitigation measures fail

4. Description of **proposed mitigation measures** to avoid, reduce or remedy impacts.

5. Description of any expected **residual impacts** after mitigation.

6. A **summary** of key findings

5.1 TIMESCALE FOR THE EIS

Figure 5.1 details the expected programme for completion of the EIS.

The EIA process will run in tandem with the route selection process and the consultation process**.** The Scoping Report will be submitted to the competent authorities with a request for a formal Scoping Opinion in May. The scoping report will be revised after each stage of route selection.

It is anticipated that detailed studies and surveys will commence in mid May 2007, with ecological surveys being generally carried out during the summer months. Site Investigations will be undertaken later in the Summer. All specialist studies will input to the EIA. It is expected that the EIS will be completed by Autumn 2007 when it will be formally submitted to the competent authorities with the relevant application(s) for approval.

5.2 SUMMARY

The scoping exercise carried out at this stage of the project has highlighted the following points:

- An Environmental Impact Statement is required for the Onshore Gas Pipeline. The EIS will be submitted with applications to An Bord Pleanála under the Strategic Infrastructure Act and the Department of Communications Marine and Natural Resources under the Gas Act and the Foreshore Act.

- Consultation with the public, statutory organisations and non-statutory organisations will be undertaken during preparation of the EIS. The results of this consultation will be used to inform the EIS and will be incorporated into the project design where practical.

- At this stage it is considered that the majority of potential impacts will be of a temporary nature and restricted to the construction stage only. Further assessment of all baseline studies together with consultation with statutory and non-statutory bodies will assist with identification of the main potential impacts for the chosen route.

- At this stage, the potential significant impacts resulting from the proposed development relate to construction in or adjacent to any designated areas of conservation (SAC, SPA, NHA), including indirect impacts; and potentially other habitats of conservation value discovered during the route selection process. Potential effects on habitats, protected species, seasonal changes, migratory species & feeding grounds will be examined in the baseline assessment to ensure potential impacts can be addressed adequately.

- The visual impact of the landfall facility will exist for the predicted lifetime of the project (15-20 yeas) after which it would be decommissioned.

- A request for opinion will be made to An Bord Pleanála and the Minister for Department of Communications Marine and Natural Resources on the information to be contained in the EIS.

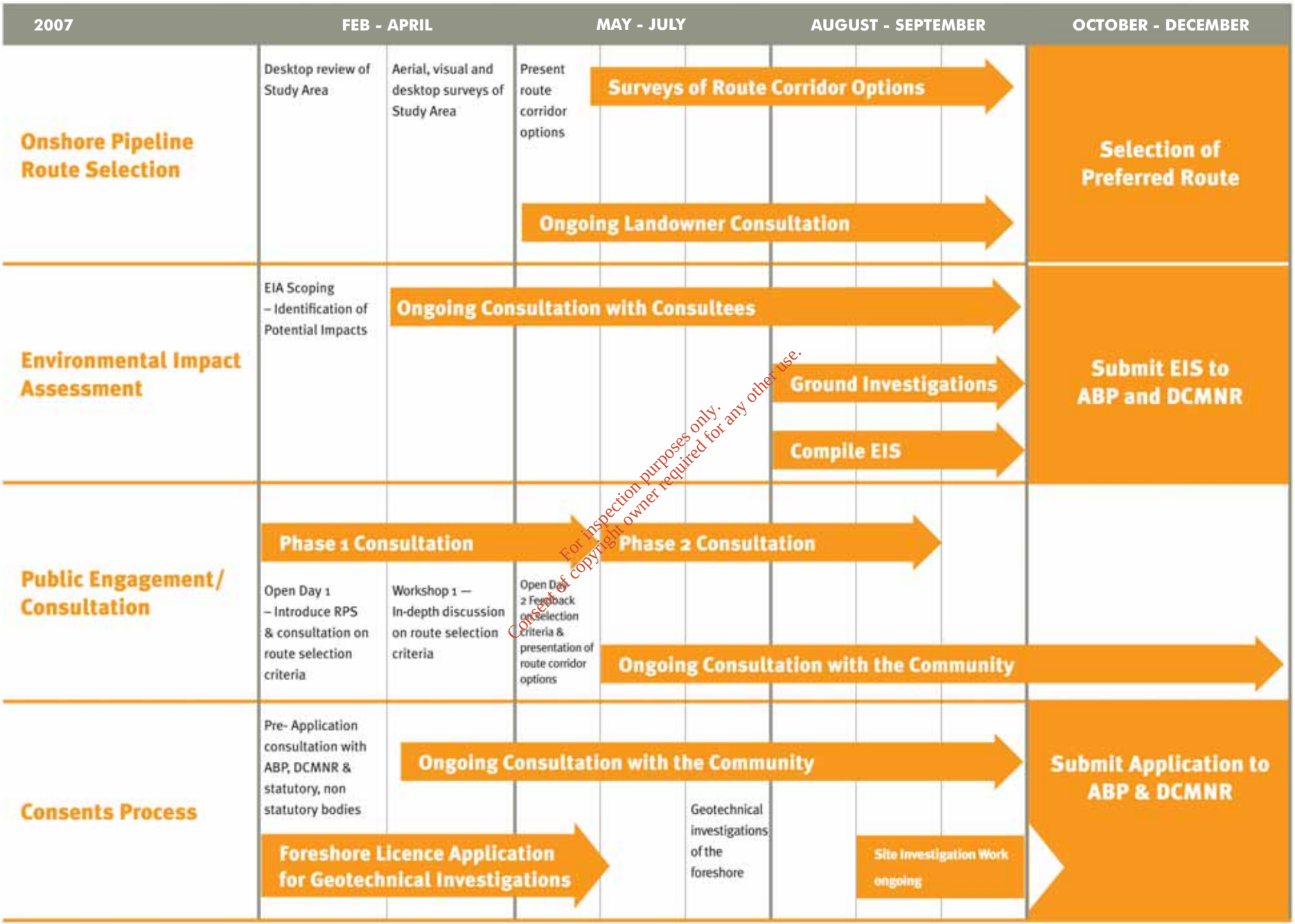

Figure 5.1 EIS Programme

APPENDIX A

Typical Construction Techniques

CONSTRUCTION METHODOLOGY THROUGH PEATLANDS

Peatland habitat is particularly sensitive to large scale construction works. The methodology employed will be based on industry best practice and work underway/completed on similar projects in the surrounding area. It will be developed in consultation with the National Parks and Wildlife Service of the Department of the Environment, Heritage and Local Government and other appropriate consultees.

The following is a summary of the measures that will be considered during the construction of the pipeline through peatland areas.

A specific site survey of the areas of bog traversed by the pipeline route will be carried out prior to any works being undertaken. This survey will be carried out by a specialist peatland ecologist and will establish the condition of the bog using a standardised definition of condition class. The condition of the bog will determine the extent of the required impact mitigation measures. Consultation with local Conservation Rangers (NPWS Staff) will be carried out prior to commencement on site to assist in the acquisition of information of local/regional relevance to conservation and in assessing the local importance of an area of bog habitat through which the pipeline passes. Bogs can also contain archaeological remains. Therefore, an experienced wetland archaeologist will also survey the proposed route and make recommendations on any mitigation measures in advance of construction.

Site Preparation*;* Stripping of the top layer of vegetation from a peatland soil exposes the very delicate soil structure to the damaging effects of vehicle movement and trampling. The working width in peatland areas may be up to 40m. It is important that this entire area is not stripped bare of vegetation as will be the case for non-peatland areas of the pipeline corridor. If possible, only the 2m wide trench area will be excavated in the area of bog habitat. Stripping of surface vegetation from a bog also removes the biological active layer of bog growth from the bog habitat and is therefore to be avoided wherever possible.

Transportation of Work Vehicles/Machinery to Pipeline Route*;* Bogs have a very low load bearing capacity and low shear strength. The shearing and compaction of the upper layers of the bog may lead to the destruction of the growing surface layer (active Sphagnum). Machinery will be selected with a low bearing pressure to minimise impact on the bog structure. As per Bord na Móna recommendations vehicles with ground bearing pressures (GBP) of less than 3 lb.inch^{-2} will be used. High bogs will require GBP of less than 2 lb.inch^{-2}. Also the number of times the bog is travelled will be kept to a minimum. The use of vehicles with low GBP will also minimised the likelihood of vehicles becoming 'bogged down'. Where necessary, geotextiles, hinged hardwood boards, wood shuttering or heavy-duty plastic netting will also be used to minimise compaction loads due to construction traffic.

Site Storage of Materials*;* The storage of heavy materials will be kept to a minimum within the working width. The main impacts from the site storage of materials on peatlands are:

- Compaction of the peat soil under the storage area and subsequent disturbance to the hydrological function of the bog.
- The elimination of light and oxygen to the vegetation of the bog surface.
- Physical crushing and compaction of the living vegetation of the bog surface.

Short-term storage of equipment (2-3 days) on site causes few problems as the vegetation can usually survive disturbances of short duration. However, longer-term storage can lead to serious problems including death of vegetation cover and irreversible changes to the physical structure of the soil caused by compaction. Therefore, all unavoidable storage of material on the bog surface should be of only short duration (<3 days) and pipe laying should preferably be carried out in short sections e.g.

200m at a time where long term on-site storage of equipment is not necessary. Where considered appropriate, depending on the condition of the bog, pipe joints and pipe-laying equipment will be placed on geotextile, wooden-boards or wooden shuttering. These surface-protection materials will offer a greater degree of protection to the bog-surface than the direct storage of pipe-laying equipment on the bog surface.

Opening of the Pipeline Trench*;* Perhaps the principal impact of pipe-laying on the bog habitat is the excavation of the pipe trench. Any trench dug in peat soils will automatically function as a drainage ditch, the function of which is deleterious to the bog habitat. Due to the importance of the maintenance of hydrological integrity of peatland habitats, it is essential that every effort be made to minimise the disruption of the hydrological processes of the bog during the excavation of the pipeline trench. Therefore, the initial opening up of the trench will involve the removal of the upper vegetated layer of peat. This layer comprises the acrotelmic peat and the rooting zone of the bog vegetation. This upper living layer of the bog should be removed and stored separately, as sods, from the other peat and soil removed from the trench.

The vegetated layer to a depth of approximately 0.5m should be excavated and stored adjacent to the trench on wooden shuttering or Geotextile material. This top layer should only be stored for a very short period (less than 3 days) and watered regularly, if required, to prevent drying out of the peat soil and minimise physical and chemical changes to the peat.

The depth of the excavated trench will depend on the depth of peat soils. Excavation will be deep enough to ensure a solid foundation for the proposed pipeline, alternatively, support piles will be constructed at appropriate intervals.

The pipe trench should remain open for as short a time period as is possible and practicable to allow the laying of the pipe and then immediately backfilled. If a rapid dewatering of the surrounding bog occurs, plywood retaining walls should be placed as a temporary dam against the trench wall to prevent a serious dewatering of the surrounding peatland.

The catotelmic (> than 0.5m deep) peat should be stored separately to the upper acrotelmic peat and any sub-peat soil also separately stored. This storage should be for short time periods (less than 3 days) and be laid on wooden shuttering or geotextile material.

It is important that the catotelmic peat is excavated and stored with as little physical mixing of the soil as possible. The maintenance of peat stratigraphy as outlined above is essential to the maintenance of the hydrological functioning of the bog. The highly humified deeper layers of catotelmic peat should not be mixed with upper less humified peats or visa versa as this may lead to a serious disruption of the hydrology of the bog.

Installation of the Pipeline*;* The actual installation of the pipe will be a minor source of disturbance to the bog surface and no special recommendations are required for this procedure.

Stabilisation of the Pipeline*;* Due to buoyancy effects the pipeline may float in aqueous peat. Measures will be required to counteract the buoyancy forces of the pipeline. These include the addition of concrete weight coating to the pipeline or the use of anchor weights. Following an engineering assessment, the appropriate weighting technique will be adopted by the contractor.

Backfilling of the Pipeline Trench*;* To ensure that drainage patterns are not adversely effected as a result of the construction of the pipeline particular attention should be given to the backfill of the excavated trench.

Habitat Reinstatement Works*;* Particular reinstatement methodologies are required to ensure that the peatlands return to their pre-construction state.

Hydrological and Ecological impacts and mitigation will be developed by the relevant specialists during the EIA.

TRENCHLESS CONSTRUCTION TECHNIQUES

In areas that are environmentally sensitive e.g. bogs/river crossings or where it is impractical to use open-cut techniques the contractor will adopt trenchless construction techniques. The choice of trenchless construction technique will be based on an engineering assessment of the geotechnical conditions at the proposed crossing location. These construction methods require increased working areas on either side of the crossing. Therefore, the wayleave will be locally increased at these locations to provide the required working area. The working areas are generally referred to as the working and reception pits with the reception pit being the smaller. Once the proposed pipeline is installed at the crossing, the pipeline is ready to tie into the standard pipeline string. The following trenchless techniques may be adopted depending on conditions.

Pipe Jacking - Thrust Boring*;* Thrust Boring is a form of pipe jacking and is based on the use of large hydraulic jacks to drive special high strength concrete pipes with a steel shield at the face. Excavation is carried out manually at the face and carted to the drive pit using a bogey and winch. Alignment is checked by laser beam and steering is achieved by adjustment of smaller jacks mounted behind the shield. This technique is suitable for use in a wide range of ground conditions and does not require complex machinery. However, a disadvantage with this technique is that it is only suitable for tunnel diameters greater than 900mm. The annulus between the proposed gas pipeline and the concrete pipe is filled with a concrete/bentonite grout.

Auger Boring; This is a variation of pipe jacking and uses a mechanical boring machine for conduits of less than man-entry size. The auger-boring machine comprises face cutters driven from the thrust/working pit by a rotating shaft. The helical auger transfers the spoil back to the pit for removal. Having established the line and level of the required duct, the working pits are constructed at either side of the crossing. The level of these pits is such that the line of the bore is at the required depth below the crossing. Therefore, support shuttering is generally required. The boring equipment consists of a cutting head at the front of a continuous line of auger. The auger and steel pipe are then thrust forward simultaneously using hydraulic rams whilst drilling takes place and the displaced spoil is removed to the working pit via an Archimedean screw through the pipe. After installation of the first length of pipe and auger, further modules are welded and coupled together until the required crossing length is achieved. The position and type of cutting head selected is determined by the ground conditions. Once the auger has reached the reception pit the augers and head are removed, leaving a clean tube to be used as either carrier pipe or as a duct into which the proposed pipeline can be pulled.

Directional Drilling*;* This technique requires suitable ground conditions and precise planning. Directional drilling is performed in stages. During the first stage a pilot hole is drilled into the ground at one side of the crossing at an angle of 10-15^{o}. The pilot hole is typically about 80mm in diameter and the pilot acts like a needle. The pilot is fully controllable and can be advanced along a predetermined profile beneath the crossing point. As the pilot proceeds, a larger washover pipe is then rotated over the pilot but a distance behind the head so as not to interfere with its control signal. Both pilot and washover pipe are assisted by the use of pumped bentonite mud to propel the drill. Eventually they will emerge at the other side of the crossing typically within 1m of the target location – such is the accuracy and sensitivity of the control equipment.

The next stage of the process involves pulling a reamer from the exit side, back towards the drilling rig. The reamer has a diameter greater than that of the pipeline to be laid. As it is pulled, sections of washover pipe are connected behind it via a swivel joint. Bentonite mud is also pumped into the hole in order to prevent it from collapsing. Once the reamer arrives at the drill rig side of the crossing, it is brought back again to the far side of the crossing to perform the same operation again, only this time the steel pipeline itself will follow.

The pipeline section to be laid will have been pre-welded and fully tested. It is pulled into place behind the reamer, an operation which is also assisted by the bentonite mud. Once the pull is complete, the pipeline is laid permanently. Pigging and other tests will be carried out after the operation to verify that no damage has occurred during the operation.

The final choice of the trenchless technique will be made by the contractor and will be agreed with the relevant authorities in advance of implementation, subject to mitigation requirements in the EIS. The chosen technique will ensure the integrity of the ground and any structures thereon. In addition, all working and reception pits will be backfilled and fully reinstated.

MARINE TRENCHING

Open-cut techniques for installation of pipelines through intertidal areas, and across major water courses would involve the cutting of trenches, probably using some form of digger. Material from the trench itself would be piled to one side of the trench at sufficient distance that it does not slump back into the trench. The pipe would then be installed and, if the sediment remains piled to the side of the trench, it would then be lifted back into the trench using a digger. In the event that the sediment is not cohesive, and there is a chance that any trench dug would fill in, sheet piling may be used to keep the trench open while the pipe was installed. If the trench is constructed across flowing water, pumps may be required to maintain that flow and reduce the possibility of a large head of water building up on one side of the trench. Once installed it is assumed that sediment which remains above the original profile of the bed will be redistributed naturally by water flow.

All marine trenching techniques will be developed in consultation with the NPWS, DCMNR and the NWRFB.

STANDARD PIPELINE CONSTRUCTION

Pre-construction Works

Ahead of construction, the route within the working width will be surveyed and pegged out in consultation with the landowner/ occupier. This will establish the alignment, particularly in relation to field boundaries, mature trees and environmentally sensitive sites. Wherever practical and where there are no other overriding considerations, full use will be made of existing gaps in hedges/sod fences and drains. Springs and seepage lines, etc., will be avoided. Water supplies fed by springs or wells used for farming processes will be surveyed and monitored.

Working Width Preparation

All construction activities will normally be undertaken within a working width, which is clearly marked out with stock proof fencing (to be agreed with the landowner). Stiles, gates or gaps will be incorporated to maintain access to public rights of way and farm tracks. This will generally be approximately 40m wide. A wider working width may be necessary for the crossing of waterways, roads, drains, and service crossings, to facilitate safe working and manoeuvring. This width is required for the access of vehicles carrying heavy plant, equipment and materials along the working width of the pipeline, with a limited number of access points. Where field boundaries are removed, particularly at road crossings, temporary secure gates will be installed to prevent unauthorised access to the working area.

Topsoil Stripping

The topsoil will be stripped across the entire working width by appropriate earth moving equipment and stored carefully at one side of it. The topsoil stack will be typically 8m wide and up to 3m high. It

will be kept free from disturbance to reduce the risk of physical damage and compaction. Generally, all vehicle movements will be confined to the 'running track' (working width) on underlying subsoil. Topsoil stripping will be monitored by a licensed archaeologist.

Stringing and Bending

This process involves the laying out of the pipeline sections along the route prior to installation. The pipe will be delivered to the area by road.

Where the ground is suitable, pipe sections will be delivered to their final location along the working width along a line parallel to the trench line. If ground conditions are soft or rough, the pipe will be offloaded at designated crossings and transported along the working width by specialised plant.

Where changes in direction take place, bending may be accomplished using a pipe-bending machine at the pipe storage area or on site. Where the changes in direction are severe, factory-manufactured bends may be utilised.

Trenching

The pipe trench will be dug either with mechanical excavators straddling or running alongside the pipeline trench or using a specialised trenching machine. The depth will be variable but will allow a minimum reinstated cover of 1.1m over the top of the pipeline in agricultural land and 1.5m below the clean bed of streams and drains. The material excavated from the pipe trench will be stored on the opposite side of the working width from the topsoil to prevent mixing of subsoil, which might hinder reinstatement.

Welding

The pipe lengths will be delivered pre-coated externally with a factory applied anti-corrosion coating and where appropriate with concrete weigh coating. Following stringing, the pipeline sections will be welded together. All the welds will be radiographically tested and approved before an approved coating is applied on site.

Backfilling

Following the completion of the pipe laying process, the trench will be backfilled using the material taken from the trench in the reverse order in which it was excavated. Sand padding and surround may be used to protect the pipe if the returned material is particularly stony and in areas of rock.

The backfilled material will be consolidated by tamping or rolling. Any surplus material from trench excavation is normally spread, wherever possible, within the working width. Any surplus is the property of the landowner/occupier who will be consulted, together with Mayo County Council as appropriate, before off-site disposal is carried out.

Post-construction land drains will be reinstalled at this stage, prior to topsoil reinstatement, permanent fencing and the removal of flume pipes and bridges will also be carried out. All land drainage works will conform with the local authority requirements.

Reinstatement

On agricultural land, after regarding of the working width to reflect the original profile replacement, the topsoil will be stone picked and cultivated as necessary.

Fencing will be removed to suit the landowners/occupiers requirements. Particular attention will be paid to the careful replacement of field boundaries to reduce the visual impact and to meet the landowner/occupier's requirement using materials that match the existing fence/wall where appropriate. Hedgerow sections that are removed will be replanted using a suitable mix of native species, while sod banks will also be carefully reinstated. This will be the subject of a Reinstatement Plan, as agreed with the National Parks and Wildlife Service (NPWS).All materials, will be removed on completion of the work.

APPENDIX B

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18.0 Noise and Vibration

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21.3 Description of the Existing Environment
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APPENDIX C

Site Synopsis of Designated Sites

SITE SYNOPSIS

SITE NAME: BROADHAVEN BAY

SITE CODE: 000472

Broadhaven Bay is a large, north facing bay situated on the north-west Mayo coast. The site extends from the innermost part of the bay at Belmullet to the outer marine area between Erris Head and Benwee Head. At its outermost part, the site is 10 km wide. Exposure to prevailing winds and wave action diminishes from the mouth toward the head of the bay. Subsidiary inlets along the length of the bay provide further areas of additional shelter.

Broadhaven Bay encompasses a range of marine and coastal habitats from extremely exposed bedrock at Benwee Head to sheltered sediments in the inner bay. There are good examples of wave-surged cave communities in shallow water with the anemone *Phellia gausapata* typically found in areas very exposed to wave action. A cave in deeper water supports colonies of the rare anemone *Parazoanthus anguicomus* and the soft coral *Alcyonium glomeratum*. The subtidal reef communities in the outer part of the bay are good examples of the zonation from kelp forest in shallow water to kelp park with an understudy of foliose brown algae and to the sponge communities in deeper water. Species richness can be high (up to 72 species) and the widely distributed but uncommon crab *Pirimela denticulata*, and hydroid *Tamarisca tamarisca* were both found at one site. In deeper water the reef communities are characterised by the Axinellid sponge community, communities tolerant of sand scour and communities typical of vertical or steeply sloping bedrock. A range of sublittoral sediments occurs within the site with sediment in the outer part of the bay characterised by bivalves or the burrowing urchin *Echinocardium cordatum*. Seagrass (*Zostera marina*) occurs in more sheltered areas and the oyster *Ostrea edulis* may be present. The inner part of the bay has extensive areas of intertidal mud characterised by polychaete communities or muddy sand which support communities of polychaetes and bivalves, typical for these substrates.

Salt marshes occur in the very sheltered areas at Tallagh and Barnatra. These are fringe marshes on peat and typical of the Atlantic salt meadow type. Species present include Thrift (*Armeria maritima),* Sea Arrowgrass *(Triglochin maritima),* Sea Plantain *(Plantago maritima),* Common Salt-marsh Grass *(Puccinellia maritima),* and the rushes *Juncus gerardii* and *Juncus maritimus.* Turf fucoids occur.

Inishderry, a small island in the inner bay, supports important numbers of breeding terns, with Sandwich Tern (81 pairs in 1995) and Common and Arctic Terns (42 pairs in 1995). The rare Little Tern has bred in the past. The island also has breeding Black-headed Gulls (100 individuals in 1995).

Broadhaven Bay is an important area for wintering waterfowl, being part of a large complex that includes the Mullet and Blacksod Bay. Based on average peak counts over the five winters 1994/95 to 1998/99 the following species have nationally

important populations: Red-breasted Merganser (38), Ringed Plover (484), Grey Plover (52), Sanderling (74), Dunlin (2,108) and Bar-tailed Godwit (484). In some winters Brent Goose numbers exceed the threshold of 200 for national and international importance. Regionally important numbers of a number of other species occur: Oystercatcher, Golden Plover, Lapwing, Knot, Curlew, Redshank and Turnstone.

This site is of high conservation importance owing to the presence of several habitats that are listed on Annex I of the EU Habitats Directive: large shallow bays; intertidal sand flats, reefs, marine caves and salt marshes. In addition it has ornithological importance for breeding and wintering birds.

3.9.2001

SITE SYNOPSIS

SITE NAME : GLENAMOY BOG COMPLEX

SITE CODE : 000500

This large site is situated in the extreme north-west of County Mayo, where the climate is wet oceanic and gales from the Atlantic are frequent. This area is underlain by metamorphic rocks, comprising mainly schists and quartzites of Moinian age. From sea-level, the site reaches 379m O.D. at Maumakeogh. The soils are predominantly peats, with underlying glacial tills usually only visible along water channels and roads. Four main river systems drain the site: the Glenamoy, the Muingnabo, the Belderg and the Glenglassra Rivers. One medium-sized lake, Lougherglass, occurs on the site.

Blanket bog, a priority habitat under Annex I of the E.U. Habitats Directive, dominates the site. Glenamoy Bog is a prime example of the extreme oceanic form of lowland blanket bog and is one of the most extensive tracts of bog in the country. The bog occupies a gently undulating plain, but extends uphill to cover the slopes of Maumakeogh and Benmore in the eastern sector of the site, and northward, out toward the sea cliffs of the north-west Mayo coastline. Peat depth reaches 6 metres in the low-lying areas. A large flush occurs at Rathavisteen, which supports species-rich vegetation, including Cranberry (*Vaccinium oxycoccos*) and a moss (*Homalothecium nitens*) which is nationally rare. Four other Annexed habitats occur in close association with the blanket bog - dystrophic lakes, wet heath, Juniper heath and transition mires. Dystrophic lakes, which lie in peaty basins and have peat-stained water, are a common feature of lowland blanket bog. At Glenamoy, the lakes are particularly well-developed. Juniper (*Juniperus communis* subsp. *nana*) occurs scattered over the blanket bog, often in association with Crowberry (*Empetrum nigrum*) and hummocks formed of mosses (*Racomitrium lanuginosum*). On steep slopes where the peat is shallow, the blanket bog grades into wet heath. Here, Ling Heather (*Calluna vulgaris*), Cross-leaved Heath (*Erica tetralix*), Tormentil (*Potentilla erecta*) and Purple Moor-grass (*Molinia caerulea*) are found. Where the heath is drier, and especially towards the northern coastal zone of the site, scattered Bearberry (*Arctostaphylos uva-ursi*) occurs with Ling and Juniper.

Transition mires or quaking bogs occur where the bog vegetation merges with flush type vegetation influenced by base enrichment, and also at the interface between large pools/small lakes and adjacent blanket bog. The vegetation is characterised by lawns of *Sphagnum*, with abundant small sedges (especially *Carex limosa*, *C. paniculata*, *C. rostrata* and *C. lepidocarpa*), Bogbean (*Menyanthes* trifoliata) and White-beaked Sedge (*Rhynchospora alba*). Diagnostic bryophytes (other than *Sphagnum*) include *Aneura pinguis*, *Drepanocladus revolvens* and *Calliergon giganteum*. A rare moss, *Drepanocladus vernicosus*, has been recorded from an area of poor fen habitat within the blanket bog complex. This is only one of 11 known sites for the plant in Ireland. This species is listed on Annex II of the EU Habitats Directive.

The coastal habitats at Glenamoy are extensive and varied. Sea cliffs extend for about 20 km along the north coast and achieve a height of 253m, at Benwee Head. They vary in physical character from sheer cliff-face to slopes of varying gradients. Typical cliff-face vegetation includes Thrift (*Armeria maritima*), Sea Campion (*Silene vulgaris* subsp. *maritima*) and Red Fescue (*Festuca rubra*). Sea stacks and several islands occur, of which Illaunmaistir is the most notable. A feature of the cliffs is the well developed cliff-top vegetation, which ranges from typical Plantain-dominated vegetation (*Plantago* sward) to coastal heath. South of Benwee Head, the rocky coastline grades into an estuarine system, Sruwaddacon Bay, which contains sand dunes and a

machair system. Machair is a form of sandy, flat, coastal grassland, and this particular machair is unusual in that it extends upslope at Garter Hill - most machairs occupy flat, low-lying plains. It is, however, now very degraded owing mainly to over-grazing by sheep. *Petallophyllum ralfsii*, a rare bryophyte, listed on Annex II of the E.U. Habitats Directive, occurs abundantly on the machair habitat. This is thought to be the second largest colony (after Slyne Head in Co. Galway) of this species in Ireland.

The sea cliffs and islands provide excellent habitat for breeding seabirds. An internationally important population of Storm Petrel (7,500 - 10,000 pairs, pre-1987), occurs on Illaunmaistir . A large Puffin colony (c.2,000 pairs, pre 1987) and a small colony of Manx Shearwaters (c.100 pairs) also occurs on Illaunmaistir. The mainland cliffs was the first breeding site in Ireland for Fulmar and now has a very substantial colony (c.2,000 pairs, pre 1987). There is a sizeable Kittiwake colony (c.400 pairs pre 1987) and small colonies of Guillemots and Razorbills (less than 100 individuals of each). Peregrine Falcon and Chough, both Annex I Bird Directive species, breed on the cliffs. Another Annex I species, Merlin, breeds on the blanket bog, as does Golden Plover . In winter, a small flock (less than 50 individuals) of Barnacle Geese visit Illaunmaistir and Kid Island.

Otter, an EU Habitats Directive Annex II species, occurs on the site, as well two other Red Data Book mammal species: Badger and Irish Hare. The Glenamoy River holds Salmon and Sea Trout.

A number of landuse practices have damaged parts of this site. Grazing by sheep and cattle is widespread and over-grazing, which leads to soil erosion, has caused damage to parts of the blanket bog, heath and machair habitats. Peat cutting, by hand and to a lesser extent by mechanised means, is widespread throughout though mostly confined to near roads and tracks. The region in general has been heavily afforested with conifers and much of the site is bounded by plantations. Within parts of the site afforestation continues and poses a threat to the blanket bog.

This site is of immense ecological importance because of the presence of a number of E.U. Annex I habitats, including two priority habitats - blanket bog and machair. It supports populations of an Annex II mammal species, two Annex II plant species and six Annex I Birds Directive species. It also has nationally important populations of other seabirds. Despite serious damage to parts of the site in recent years, large areas remain in good condition. Considerable archaeological interest is contained within the site, including the renowned Céide Fields. Furthermore, the site is of outstanding scenic value.

15.10.2001

SITE SYNOPSIS

SITE NAME: POLLATOMISH BOG NHA

SITE CODE: 001548

Pollatomish Bog NHA is an area of lowland blanket bog adjacent to the Glenamoy - Belmullet road about 7 km south of Pollatomish in the townlands of Muingeroon, Muingeroon North, Muingeroon South and Bellanaboy in Co. Mayo. The site is located on the slopes of Muingeroon Hill and covers an altitude range of between 20 m and 140 m. Bedrock geology consists of schist.

The blanket bog surface is quite wet and supports bog moss lawns (mainly *Sphagnum papillosum* and *S. capillifolium*). The most intact areas are dominated by Deergrass (*Scirpus cespitosus*), Purple Moor-grass (*Molinia caerulea*), Black Bog-rush (*Schoenus nigricans*), Hare's-tail Cottongrass (*Eriophorum vaginatum*) and Common Cottongrass (*Eriophorum angustifolium*). Bog-myrtle (*Myrica gale*), Ling Heather (*Calluna vulgaris*), Bell Heather (*Erica cinerea*), Cross-leaved Heath (*Erica tetralix*) and Mat-grass (*Nardus stricta*) are common, while White Beak-sedge (*Rhynchospora alba*), Bog Asphodel (*Narthecium ossifragum*) and Heath Rush (*Juncus squarrosus*) are occasional. Lichen species are common (*Cladonia ciliata*, *C. uncialis*, *C. portentosa*) as are mosses (*Campylopus introflexus*, *Hypnum jutlandicum, Leucobryum glaucum*) and liverworts (*Pleurozia purpurea*).

Shallow pools, many of which are in-filling with Bogbean (*Menyanthes trifoliata*), Lesser Bladderwort (*Utricularia minor*), Bulbous Rush (*Juncus bulbosus*) and bog mosses (*Sphagnum* spp.) are also present. Further up the slopes the peat becomes shallower and the vegetation more heath-like in character, dominated by Ling Heather. Juniper (*Juniperus communis*), an uncommon species on bogs, is present in this area and a number of shallow peat cracks support Royal Fern (*Osmunda regalis*), Hard Fern (*Blechnum spicant*) and Heath Milkwort (*Polygala serpyllifolia*).

The lower northern slopes are degraded through grazing and erosion and are generally dominated by grasses and sedges. The following species are amongst those found in this area; cottongrasses, Deergrass, Sweet Vernal-grass (*Anthoxanthum odoratum*), Green-ribbed Sedge (*Carex binervis*), Carnation Sedge (*Carex panicea*) and Heath Bedstraw (*Galium saxatile*).

The Irish Hare and Common Frog, both Irish Red Data Book species, frequent the site.

The land is used for rough grazing of sheep and cattle and a number of drains have been excavated in the bog. Cutting of turf by hand and machine is also occurring along the site margins. Conifer seedlings from adjoining plantations are colonising the bog.

Pollatomish Bog NHA is a lowland blanket bog of conservation importance as it contains a good diversity of microhabitats including flushes, the headwaters of a number of small streams and a number of bog pools. The presence of Irish Hare and Common Frog is also of note as is the occurrence of Juniper. Blanket bog habitat is a globally scarce resource. It is largely confined to coastal regions with cool, wet, oceanic climates at temperate latitudes. North-west Europe contains some of the best-developed areas of blanket bog in the world. Lowland blanket bog comprises less than 3% of the world's peatlands. In Europe this type of blanket bog is restricted to Ireland, Britain, Norway and Iceland. The lowland blanket bog that occurs in Ireland is considered to be an extreme hyperoceanic variant of the habitat type, found nowhere else in the world except on the coastal fringes of north-west Scotland.

23.2.2004