

17 INDIRECT, CUMULATIVE IMPACTS AND IMPACT INTERACTIONS

The purpose of this chapter is to discuss the indirect (or secondary) and cumulative impacts of the proposed Corrib Onshore Pipeline development. Although the indirect impacts as they relate to particular issues (e.g. terrestrial ecology, air and noise) have generally been discussed within Sections B – D of the EIS, these are consolidated in this section of the EIS. In addition, while Sections B – D establish the full extent of the direct impacts associated with the proposed development, this section provides a discussion on the inter-relationship of these impacts during the construction phase of the proposed development.

Section 17.1 below describes separately indirect (secondary) impacts of the proposed development and the impact inter-relationships are discussed in Section 17.2. Some overlap exists in the discussion between these impacts. Cumulative impacts relate to the proposed Corrib Gas Field development as a whole including the proposed Onshore Gas Pipeline and are discussed in Section 17.3.

The assessment of these impacts has been undertaken with regard to EPA documents ‘Guidelines on the Information to be contained in Environmental Impact Statements 2002’ and ‘Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)’ 2003. It has also been prepared with consideration to the EU ‘Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions’, prepared for the European Commission (1999).

17.1 INDIRECT (OR SECONDARY) IMPACTS

The EPA Guidelines for EIS describe indirect impacts as:

‘impacts which are caused by the interaction of effects, or by associated or off-site developments’.

In the case of this development, indirect impacts are those which are considered to be caused by consequential associated development i.e. not directly part of the project, but associated with the project, e.g. aggregate extraction. In addition to associated developments, some mitigation measures can also cause indirect impacts e.g. the requirement for offsite peat storage and disposal as a result of prohibiting the storage of excavated peat in the temporary working area to minimise the impact on intact and designated bog. These are described in Section 17.1.4.

17.1.1 Road Maintenance

The public road network will provide access to the temporary working area of the pipeline during the construction phase. Pavement condition surveys of the proposed construction haul route have been carried out which indicate areas where preventative and ongoing maintenance works are likely to be required during the construction phase. A temporary minor junction improvement at the L-52453-0 and L-52453-25 intersection is also proposed on private land to facilitate the turning movements of construction traffic. It is proposed that this land will be reinstated to its former condition upon completion of construction.

While these works will result in negative impacts of a temporary nature (as a result of disturbance during the works) the improved roads will be a permanent positive impact for local road users. Further information describing the potential impacts of the road maintenance works associated with the proposed development are provided below.

17.1.1.1 POTENTIAL IMPACTS

Community & Socio Economic

During the road maintenance works there will be temporary disturbance to the local communities along the local road network, where the works are proposed. However, such impact will be minimised with the implementation of suitable mitigation measures as discussed below.

Traffic

The proposed Traffic Management Plan in Appendix E, outlines the expected quantities and loads of material for the road maintenance works. These loads were included in the overall Traffic Impact Assessment (TIA) as outlined in Chapter 7 and Appendix F of this EIS.

Air Quality

Section 8.4 addresses the potential local impacts on air quality resulting from construction dust and construction traffic emissions on sensitive receptors along the proposed haul routes (see Figure 7.7) resulting from the proposed development. As maintenance works will be undertaken along sections of the haul route, the potential impacts outlined in Section 8.4 can be considered worst-case scenario for the proposed road maintenance works because the scale and level of works required for the road maintenance works will be much less than those required for the proposed development. Similar mitigation measures as outlined in Section 8.5 will apply for the proposed road maintenance works.

Climate

Vehicles delivering materials for the maintenance works have been considered in the assessment of total greenhouse gas emissions in Chapter 8. This assessment concludes that 'the contribution of greenhouse gas emissions arising from the construction of the onshore pipeline in the context of the national emission levels is negligible'. As the scale of works associated with the road maintenance works will be considerably less it follows that the greenhouse gas emissions from this activity will be negligible.

Noise & Vibration

Section 9.2.3.3 'Development Related Traffic – Noise & Vibration', addresses the temporary localised increase in noise and vibration in the vicinity of the local road network as a result of the proposed development. This assessment also considered the traffic associated with the proposed road maintenance works. In addition there will be a temporary increase in noise & vibration resulting from the proposed works, but these will be temporary in nature. Again, similar mitigation measures as outlined in Section 9.5 will apply for the proposed road maintenance works.

Landscape

As outlined in Section 1.4.3 'During Construction Stage & Commissioning' of Appendix I 'Landscape & Visual Impact Assessment', road maintenance has been considered along the local road network in the assessment. As the works are temporary in nature, existing views will be returned for all properties along the road network once works are complete. Satisfactory reinstatement of any disturbed landscapes along the road network will result in no residual landscape impacts.

Material Assets

At the proposed junction improvement, permission has been sought from the landowner, who will be appropriately compensated for any temporary loss of land.

The main potential impact that may occur in the vicinity of the proposed road maintenance works is disturbance or interruption to utility supply. No significant impact is anticipated during construction. It is expected that all utilities in the area will remain operational for the duration of the construction period for the road maintenance works. In the event that any utilities have to be disrupted, advance notice will be given and approval for the works to proceed will be received, from the relevant authority or utility company in advance of construction. If required, alternative or replacement utility services will be provided. Any utility affected by the road maintenance works will be quickly reinstated and made fully operational without delay.

Terrestrial Ecology

Section 6.2.1.8 of Appendix J1 recommends that road margins should be inspected prior to maintenance works commencing in order to target appropriate mitigation measures if necessary.

The following summarise the potential impacts on habitats, non-avian fauna and birds based on the above description of the proposed works and an initial assessment of habitats along the road network to be maintained.

Habitats:

The habitats along the road network are varied with much of the area dominated by blanket bog (cutover, eroded and intact), wet rushy grasslands, and improved or semi-improved grassland. Field boundaries consist largely of earthen banks, fence-lines and roadside drains.

Road margin surveys will identify any habitats of vegetation and/or faunal interest which would require the implementation of mitigation measures during road maintenance. It is noted that approximately, 700m of the eastern side of the L52453-0 comprise the boundary of the Glenamoy Bog Complex cSAC.

Non-avian fauna:

A brief examination (involving a drive by and brief walks along relevant sections of the road network) of potential faunal issues was undertaken in February 2008. It concluded that road maintenance works could affect faunal species of ecological interest, including protected species such as frogs, and recommended a number of mitigation measures to avoid/minimise such impacts.

Potential frog breeding sites (principally roadside drains) were noted along the roads in the locality that may require maintenance. Road maintenance could affect such frog breeding sites. Mitigation measures may be required to protect frogs along the roadside margins. This may include, for example, frog translocation under licence from NPWS.

Previous surveys in the locality have reported low bat activity in the area. However any structures with bat roosting potential along the margins of the road network – for example, stone culverts - will be checked by a bat expert. Where necessary, mitigation measures will be implemented in accordance with the advice from the bat specialist.

Badger setts (and similar resting places) are not expected along the road network to be maintained. However, in accordance with best practice, the route will need to be surveyed by faunal experts in advance of commencement of any road maintenance works.

No otter holts were found along the road network and it is unlikely that otter holts will be affected by the proposed road maintenance works. However, a survey will be conducted in advance of works.

Birds:

Owing to the scale and temporary nature of road maintenance works, impacts on the local bird population are not anticipated. However, if vegetation is to be cut back then it will be first inspected for the presence of nesting birds. Furthermore, good working practices will prevail throughout the duration of road maintenance works.

Aquatic Ecology

Drains and streams are present along and adjacent to the local road network. However, the proposed maintenance works will not require any alterations to culverts/bridges. Any potential impacts including the release of suspended solids/contamination during the works will be managed through the implementation of appropriate mitigation measures.

Soils & Geology

Potential impacts on soils and geology include accidental spillage of contaminants into adjacent peatlands and possible movement of peat. Mitigation measures as outlined in Chapter 15 of the EIS will also apply for the proposed road maintenance works.

Archaeology, Architectural & Cultural Heritage

As outlined in Appendix N of the EIS 'It is not anticipated that any proposed maintenance works to the already existing road network will impact on archaeological, architectural or cultural heritage'. Consequently no archaeological mitigation measures or monitoring are recommended during these works.

Indirect Impacts

It is anticipated that approximately 6,000m³ of stone/bitumen and geotextiles will be required for the proposed road maintenance works. The extraction of these material requirements will impact negatively on locally available natural resources, however, where possible, stone will be sourced from local quarries to minimise traffic impact. The sourcing and purchasing of materials will have a positive local economic impact.

17.1.2 Aggregate Extraction

Approximately 170,000m³ of stone will be required for the construction of the proposed development. The extraction of these material requirements will impact negatively on locally available natural resources (see Chapter 11), however where possible, some of the stone used for temporary haul roads will be re-used post construction. In addition, where possible, stone will be sourced from local quarries to minimise traffic impact (see Chapter 7). The sourcing and purchasing of materials will have a positive local economic impact.

17.1.3 Economic

Indirect employment opportunities are likely to be created during the construction phase through increased demand for a range of goods and services, including construction materials and rental or guesthouse/hotel/B&B accommodation. This will have temporary socio-economic benefits for local residents, retailers and other commercial operators e.g. accommodation services and transport companies including increased workforce participation and income levels.

17.1.4 Indirect Impacts Resulting from Mitigation Measures

Table 17.1 summarises the main mitigation measures, which will result in a subsequent indirect impact and associated secondary mitigation measures. These indirect impacts have been considered in Sections B-D of Volume 1 of this EIS and Volume 3 of the EIS, which describes the proposed peat deposition site at Srahmore and the proposed operations to dispose of approximately 75,000m³ of peat from the construction of the onshore pipeline.

Table 17.1: Indirect Impacts resulting from Mitigation Measures.

Potential Direct Impact	Mitigation Measure	Indirect Impact	Mitigation Measure
Impact on sensitive bog habitat (see Chapter 12)	Reduce excavation of the top surface living layer of bog by installing stone road.	Increased materials requirement.	Source local material to reduce traffic impacts and resultant emissions. Re-use stone where possible.
	Prohibit storage of excavated peat on top of surface of intact bog.	Offsite storage and disposal of excavated peat.	Appropriate disposal of excess peat to a permitted site.
	Install inert plugs to prevent creation of preferential flow path, subsequent damage and drying out of the bog.	Preservation of any potential archaeological features. Positive indirect impact.	n/a
Impact on marine environment (see Chapter 14)	Use Trenchless Methods.	Requirement for additional temporary working areas (including stringing areas) on both sides of each crossing. Possibility of intervention pit.	Careful site selection to minimise potential impacts on human, natural environments and cultural heritage. Appropriate construction management to minimise impact on seabed and water quality.
		Disposal of cuttings.	Appropriate disposal of waste to a permitted site.
		Use of bentonite.	Careful monitoring and management of use and disposal of bentonite.

17.2 IMPACT INTER- RELATIONSHIPS

The EIA Directive requires that the ‘inter-relationships’ and ‘interactions’ between specified environmental effects be considered. While almost all environmental aspects are inter-related to some degree only the significant interactions were taken into consideration in this assessment. For example, noise can interact with a number of environmental aspects. Noise issues primarily feature under the heading of ‘Human Environment’ and most of the standards and guidelines on noise relate exclusively to human beings. However, noise can also impact on terrestrial fauna such as birds and material assets in the form of commercial livestock and so it must be taken into account as part of the ecological and agricultural assessments.

Interactions have been clearly identified in the early stages of the project and where the potential exists for interaction between environmental impacts, the EIS specialists have taken the interactions into account when making their assessments. Where there is interaction between two disciplines, the impact of lesser relevance to one discipline has referred to the impact in the other discipline. This ensures that the main aspects of the proposed development are considered overall as well as separately.

Summary details on the main direct impacts that result in interactions between environmental effects are provided in Table 17.2 for the construction phase of the proposed development.

Table 17.2: Summary of Potential Interactions resulting from the Construction Phase of the proposed Corrib Onshore Pipeline Development.

Environmental Topic	Potential Impact	Inter-relationship	Potential Impact	Refer to Chapter / Section
Human Environment				
Traffic	Increase in traffic on local roads	Community	Reduced recreational amenity & residential quality	Chapter 6
		Terrestrial Ecology	Disturbance to wildlife	Chapter 12
Air Quality and Climate	Increase in dust/air emissions	Community	Reduced recreational amenity & residential quality	Chapter 8
		Ecology	Disturbance to wildlife	Section C
Noise and Vibration	Increase in noise	Community	Reduced recreational amenity & residential quality	Chapter 9
		Ecology	Disturbance to wildlife	Section C
		Material Assets	Disturbance to livestock	Chapter 11
Landscape and Visual Impact	Change in landscape character	Community	Reduced recreational amenity & residential quality	Chapter 10
		Ecology	Disturbance to wildlife	Section C
Natural Environment				
Terrestrial Ecology	Loss of habitat/species	Community	Reduced recreational amenity	Chapter 6
		Freshwater Ecology	Loss of habitat/species	Chapter 13
Soils and Geology	Contamination of soils	Ecology	Loss of habitat/species	Chapter 15
		Groundwater / surface water	Reduced recreational amenity	
	Impact on drainage	Archaeology	Increased deterioration to adjacent archaeological features	Chapter 16
		Material Assets	Reduced farm productivity due to disturbed field drainage systems	Chapter 11
Cultural Heritage				
Archaeology	Disturbance of archaeological finds	Community	Impact on cultural heritage	Chapter 16

Table 17.2 shows that the inter-relationships identified during the construction phase of the project are mainly between ecology and community. However, as suitable mitigation measures will eliminate/reduce the possibility of these temporary effects during the construction phase, the above interactions will be avoided or significantly reduced.

17.2.1 Interaction of Construction Schedule and the Environment

It is expected that the construction phase will be carried out over twelve months. Therefore, it will inevitably coincide with a number of environmental sensitivities including migrating salmonids in the March to May and July and August period, over-wintering birds in the October to March months (inclusive) and the avoidance of vegetation clearance between March and August (inclusive) due to nesting birds. Where it will not be possible to schedule construction outside these specified time periods, suitable mitigation measures to minimise the potential for impact are recommended. These environmental sensitivities have been outlined in the discussions of each environmental element in previous chapters of this EIS. Table 17.3 presents a summary of the key sensitivities that will coincide with construction activities.

Table 17.3: Potential Interaction of Key Environmental Sensitivities.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Construction Activities												
Migrating salmonids (see Chapter 13, 14)												
Over-wintering Birds (see Chapter 12)												
Nesting Birds (see Chapter 12)												

17.3 CUMULATIVE IMPACTS

A cumulative impact can be considered as an impact on the environment that results from incremental changes to environmental parameters when added to changes brought about by other past, present or reasonably foreseeable actions (European Commission, 1999). Cumulative impacts can result from individually minor but collectively significant actions taking place over the same period of time or/and within the same geographical area.

Cumulative impacts therefore 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 insignificant) in the same geographical area, and occurring at the same time, result in a cumulative impact that is collectively significant. This impact is known as a synergistic cumulative impact.

To address the cumulative impacts for the proposed development, an understanding and knowledge of historical, existing, and reasonably foreseeable future activities are essential. It was assumed that current day-to-day activities within the area would continue into the future. These activities include agriculture, forest management (felling in rotation) and other primary activities, residential development and generally moderate commercial activity. On examination of current activities and land-uses and the continuation of these activities it was deemed that they would not contribute significantly to compound an impact so were not considered further in this cumulative impact assessment.

In identifying proposals and projects for consideration in estimating cumulative impacts, only projects known to be executed within the next 15-20 years can be considered. The Corrib Gas Field Development is not currently designed to cater for future tie-ins from other gas field developments and any such tie-ins would require a design review of the project and a review of the statutory approvals process. In this regard, when considering cumulative impacts in the future, those developments which are currently in the planning process are considered reasonably foreseeable actions. At the time of writing this EIS, no other developments, which would contribute cumulative impacts, are planned in the local and wider area.

The following elements, which have the potential to contribute to cumulative impacts, were addressed as part of the cumulative impact assessment for the proposed development:

1. Corrib Gas Project, which consists of the following elements in addition to the proposed Onshore Gas Pipeline considered in this EIS:
 - a. Offshore gas field development including seabed installations and offshore pipeline (works ongoing and expected to be completed in Summer 2009 & Summer 2010)
 - b. Bellanaboy Bridge Gas Terminal (Construction ongoing 2006-2009)
 - c. An Srath Mór (Srahmore) Peat Deposition Site (Deposition from Terminal completed in 2007)
 - d. An Srath Mór (Srahmore) Peat Deposition Site (Deposition from onshore pipeline) (see Volume 3 of the EIS)
2. BGE Mayo to Galway pipeline (Constructed 2005 – 2006 and final tie-in to Bellanaboy Bridge Gas Terminal 2009)

In addition, maintenance works of the local road network have been considered (see Section 17.1.1) However, due to the scale and temporary nature of these proposed maintenance works, any cumulative impact with other elements of the Corrib Gas Field Development will be negligible.

In all cases, the residual impacts arising from each proposal have been identified. Cumulative impacts have been assessed at a national (see Section 17.3.1) and regional scale (see Section 17.3.2).

17.3.1 National

The impacts of the Corrib Gas Field Development have been considered in the context of effects on the national economy and compliance with national policy.

The Goodbody Report¹ (2007) identifies that the Corrib Natural Gas Field Development will contribute over €3bn to Ireland's GDP over its lifespan, supplying up to 60% of the country's natural gas needs at peak production. The gas field is estimated to yield approximately one trillion cubic feet of natural gas over an operating life of fifteen to twenty years.

The Corrib Gas Project supports Ireland's proposed national strategic fuel switch from solid fuel and oil to natural gas and renewables and so contributes to Ireland's target to limit national greenhouse gas emissions while ensuring security of energy supply (see Preamble). A fuel switch from oil and coal gas will also result in lower NO_x and SO_x emission levels nationally.

The Corrib Gas Field Development will make a significant contribution to Ireland's national energy supply by moderating Ireland's dependence on imported energy. It will also provide stable and economic energy supplies, enhancing the sustainability of existing industry in the Border Midlands and Western Region.

As well as providing natural gas for homes in the region, the Corrib Gas Field Development will make the North West a more attractive investment destination. Potential investors will be attracted by the availability of natural gas as a reliable source of energy. In addition, the availability of natural gas may lead to electricity generation in the area, which could improve the reliability of electricity supplies. As well as being a benefit for the residents of the area, this is in line with the national need to promote balanced regional development.

¹ Economic Assessment of the Corrib Gas Project, Goodbody Economic Consultants, November 2007

17.3.2 Local & Regional

At a local and regional level, impacts of the Corrib Gas Project and the Bord Gais Éireann Mayo to Galway Pipeline have been considered in the context of effects on the human and natural environment and on cultural heritage. As outlined in Section 17.3, the various elements of the Corrib Project are at different stages of completion, and therefore interactions will not necessarily occur between all elements. For example, construction of the onshore Mayo to Galway Pipeline and Peat Removal from the Gas Terminal at Béal an Átha Buí (Bellanaboy) Bridge to An Srath Mór (Srahmore) have already been completed. The Terminal is currently under construction and is expected to be completed by end of 2009. The offshore pipeline (including the umbilicals) from the manifold to the landfall is scheduled to be constructed in 2009, while the installation of the offshore umbilical is scheduled for 2010.

Construction progress and activities (completed and incomplete) and the future programme of works for the various components of the project are detailed in Figure 17.1.

The main residual impacts arising from each of the individual elements of the development have been assessed for their potential to interact with each other. Impacts of the operational phase of the overall development mainly arise from the Gas Terminal. The remaining elements of the overall development result in few operational impacts and therefore few cumulative operational impacts. These include positive local and regional economic impact arising from the Corrib Gas Field Development, incorporating the community gain arising from the project (see Chapter 6). The Landfall Valve Installation (LVI) will be the only above ground feature of the Corrib Onshore Pipeline. However, no significant visual impacts are predicted for properties with a potential view across the location of the LVI.

Consequently the cumulative impact assessment has focused on impacts arising from construction activities. However, it should be noted that the majority of impacts during the construction phase will be of a temporary nature and will in general only impact on environmental resources on a local basis.

For the purposes of this cumulative impact assessment, the accumulation of temporary construction impacts of all elements (regardless of whether works are completed or about to be completed) are considered with the accumulation of temporary construction impacts within the planned construction phase of the proposed Corrib Onshore Pipeline development (approximately twelve months) commencing in late 2009/early 2010. It is anticipated that works associated with the completion of the construction of the Terminal and the Onshore Pipeline will overlap for a period during this time. Although it is anticipated that works associated with the installation of the offshore umbilical will also overlap during this time, the potential for cumulative impacts will be limited to works at the Landfall site. Furthermore, any cumulative impacts resulting from increased traffic, noise, dust and visual disturbances associated with this activity will only last for approximately one month.

An overview of the impacts arising from each of the distinct elements of the development on the human, natural environment and cultural heritage are provided below in sections 17.3.3 – 17.3.5 and Table 17.4, together with an assessment of the cumulative impact.

A separate assessment of the cumulative emissions of greenhouse gas emissions arising from the construction and operation of the Corrib Gas Field Development is provided in Section 17.3.6.

	2004				2005				2006				2007				2008				2009				2010							
	Q1	Q2	Q3	Q4																												
Gas Terminal																																
Peat Removal & An Srath Mór (Srahmore) Deposition Site																																
Mayo to Galway Pipeline*																																
Offshore Gas Field (incl. Wells)																																
Offshore Pipeline & Landfall (incl. Outfall Pipeline)																																
Onshore Pipeline Landfall to Terminal																																
Offshore Umbilical Installation																																

Figure 17-1: Corrib Project Construction Progress to date and Proposed Construction Programme

*Pipe tie-in (Mayo – Galway pipeline) to Corrib pipeline in Q1 2009.

17.3.3 Human Environment

17.3.3.1 Local Employment

Bellanaboy Bridge Gas Terminal

Approximately 800-850 people will be employed during construction of the Gas Terminal providing a positive impact on the local economy during the 2-year construction period with enhanced opportunities for local service providers.

Peat Removal and An Srath Mór (Srahmore) Peat Deposition site

During peat removal from the Terminal to the An Srath Mór (Srahmore) Peat Deposition Site it was predicted that this activity would result in the employment of approximately 50-55 people. However, impacts were predicted to be negligible as the intention was to utilise existing staff to man the proposed facility².

Peat removal from the Onshore Pipeline will also provide direct and indirect job creation during the peat deposition activity.

Mayo to Galway Gas Pipeline

An estimated 500 people were predicted to be employed during construction and reinstatement of the Mayo to Galway Pipeline. In addition, short-term benefits to local communities in terms of increased income in shops, pubs, cafes/restaurants and accommodation and indirect employment were predicted as a result of pipeline construction activities.

Offshore Development

Construction of the Offshore Seabed Installation is predicted to involve a workforce of approximately 200 to 300 people over the construction period. However, this is mainly an international specialist workforce with limited local benefits. Construction of the landfall is predicted to have a positive impact on the local economy, with enhanced opportunities for local service providers. These will include increased trade in local shops, pubs, restaurants, and service providers. There will also be opportunities for supply of equipment, catering, transport and delivery of goods. There will also be tangible economic benefits to Killybegs from the offshore components of the project.

Onshore Corrib Gas Pipeline

Construction of the Onshore Pipeline is predicted to result in a significant and positive impact on the local economy from major employment opportunities and construction of the pipeline. During construction it is estimated that 120 – 140 employees will be employed on the onshore pipeline project. The onshore pipeline is predicted to have an overall positive economic impact on the existing community.

Cumulative Impact

As detailed in the Goodbody Report, construction of the Development will result in significant benefits for the local economy. The local Mayo economy will directly benefit by approximately €181m as a result of the Corrib Development. In excess of 800 jobs will be created during the construction phase

²In practice there was a positive impact as existing staff had been rehired by the time work had been done.

including direct, indirect and induced employment. This will result in a positive cumulative impact during construction.

17.3.3.2 Tourism and Recreation

Bellanaboy Bridge Gas Terminal

The Gas Terminal is predicted to result in negligible short term impacts on visitors to the area during the construction period. Whilst Bed & Breakfast and self catering type accommodation will benefit from increased trade, visitors to the local area who pass the Terminal site will notice site activity, increased traffic movements and construction activity.

Peat Removal and An Srath Mór (Srahmore) Peat Deposition site

In terms of the An Srath Mór (Srahmore) Peat Deposition Site, most major tourist attractions are sufficiently remote from the site for their associated visitors to be unaffected by the peat deposition activity.

Mayo to Galway Gas Pipeline

The Mayo to Galway Pipeline was completed in 2006. Negligible short term impacts existed on visitors to the area during the construction period.

Offshore Development

The Offshore Seabed Installation is predicted to result in imperceptible impacts on tourism and recreation. Attractions are sufficiently remote from the offshore activities and therefore associated visitors will be unaffected during construction.

Onshore Corrib Gas Pipeline

The development will have a slight to moderate and temporary negative impact upon visiting communities of the local and wider vicinity of the proposed route during the construction.

Cumulative Impact

None of the construction activities associated with the elements of Corrib Gas Field Development are expected to impact significantly on tourism and recreation. As all elements will not occur simultaneously, cumulative impacts will be mainly limited to the construction of the Terminal and Onshore Pipeline. Where cumulative impacts do occur they will be temporary in nature and are not expected to be significant.

17.3.3.3 Traffic

Bellanaboy Bridge Gas Terminal

In terms of the Gas Terminal, the traffic assessment concluded that the local road network could adequately cater for traffic volumes generated during the construction phase.

Peat Removal and An Srath Mór (Srahmore) Peat Deposition site

In terms of the movement of peat from the Terminal to the An Srath Mór (Srahmore) Peat Deposition Site, the traffic assessment concluded that the local road network could adequately cater for traffic volumes generated by the construction of the project. The main traffic impact was predicted to result from damage to the road pavement due to heavy construction traffic. This was mitigated through extensive upgrading of local roads.

The Traffic Impact Assessment and Traffic Management Plan provided in Chapter 7 and Appendix E & F has taken account of the cumulative impact of all traffic associated with the movement of peat to An Srath Mór (Srahmore) from the construction of the Onshore Pipeline.

Mayo to Galway Gas Pipeline

The Mayo to Galway Pipeline was predicted to result in moderate adverse short-term impacts on local traffic along the proposed pipeline route as a result of construction traffic associated with the delivery of pipe, equipment, fencing, hardcore, sand padding and supplies to construction areas and, and the subsequent removal of temporary facilities upon completion.

Offshore Development

The Offshore Seabed Installation (offshore component) is predicted to result in moderate short term adverse impacts to near shore fishing activities as a result of the presence of the pipelay vessels and their associated support vessels during construction. In terms of the landfall, the traffic assessment indicates that the existing road network can adequately cater for the volumes of traffic generated during construction but will benefit from strengthening works prior to intensification of the construction traffic.

Onshore Corrib Gas Pipeline

In terms of the Onshore Pipeline, the traffic impact assessment has predicted that the road network surrounding the development is capable of facilitating the construction activities. There will however be a moderate impact on the local road network surrounding the development during the construction stage but this will be temporary.

Pavement condition surveys of the proposed construction haul route have been carried out which indicate areas where ongoing preventative and maintenance works are likely to be required during the construction phase. These maintenance works will result in a local positive impact for local road users.

Cumulative Impact

Construction traffic associated with all elements of the Project has, and will continue to result in increased traffic volumes and may cause delays to other road users for the duration of the construction. However, for future works only traffic associated with the construction of the Terminal and Onshore Gas Pipeline will occur simultaneously. Furthermore, traffic associated with the Terminal construction in 2009 will be mostly from cars belonging to personnel working at the site. Although there may be some overlap in 2009, which will lead to a cumulative traffic impact on the local road network, the impact will be slight. This will be further reduced through the implementation of a Traffic Management Plan (see Appendix F) and the maintenance of local road network.

17.3.3.4 Air Quality

Bellanaboy Bridge Gas Terminal

Construction of the Gas Terminal will result in emissions of dust, and exhaust fumes from traffic and machinery, however construction activities are not predicted to result in significant negative air quality impacts.

Peat Removal and An Srath Mór (Srahmore) Peat Deposition site

During peat deposition from the Terminal, the An Srath Mór (Srahmore) Peat Deposition Site was predicted to result in a minor localised impact on air quality through dust generated during positioning of peat at the depository, and exhaust fumes from haulage on onsite vehicles and equipment. Similar impacts will arise from peat deposited from the Onshore Pipeline.

Mayo to Galway Gas Pipeline

The Mayo to Galway Pipeline was predicted to result in a minor localised impact on air quality through exhaust fumes from machinery used during construction.

Offshore Development

The Offshore Seabed Installation is not predicted to have a significant impact on air quality in view of the short duration or periodic nature of most of the activities associated with the offshore works. In general, there are no resident sensitive receptors offshore and impacts will be negligible. The distances from the landfall and Sruwaddacon crossings are such that there will be no impacts from emissions to air upon local residents.

Onshore Corrib Gas Pipeline

The Onshore Pipeline will result in emissions of dust from construction and emissions from construction traffic. However this is not predicted to result in significant air quality impacts. The local impacts to air quality along the proposed haul routes as a result of construction traffic are considered to be temporary slight negative.

Cumulative Impact

Construction activities associated with all elements of developments will result in temporary impacts on local air quality. In terms of cumulative impacts it is anticipated that only works associated with the construction of the Terminal and Onshore Gas Pipeline will occur simultaneously. However, as the construction of the onshore pipeline progresses along the route the impact on individual receptors within close proximity to both the Terminal and route will diminish rapidly. Where cumulative impacts do occur they will be slight and temporary in nature. Peat deposition will not result in an increased cumulative impact on air quality as An Srath Mór (Srahmore) is located sufficiently away from the other elements of the Corrib development.

17.3.3.5 Noise

Bellanaboy Bridge Gas Terminal

The construction of the Gas Terminal will inevitably lead to increased noise levels. However, as the site is remote, it is expected that compliance with normal construction noise controls can be achieved. Any particularly noisy operations are planned in advance in order to ensure that appropriate community liaison can be put in place.

Peat Removal and An Srath Mór (Srahmore) Peat Deposition site

Peat deposition from the Terminal to the An Srath Mór (Srahmore) Peat Deposition Site was predicted to result in minor short-term impacts on noise generated by the transfer of material to the site and movement within the site during construction. Similar impacts will arise from peat deposited from the Onshore Pipeline.

Mayo to Galway Gas Pipeline

The Mayo to Galway Pipeline was predicted to result in minor temporary short-term impacts on noise during construction as a result of rock breaking and excavation.

Offshore Development

The Offshore Seabed Installation (offshore component) is predicted to result in negligible impacts on noise. At 65km offshore, the drilling rig and vessel activities are too far from human sensitive receivers to be of concern. The Offshore Pipeline Installation (nearshore component) is not predicted to result in significant impacts on noise. Vessels will normally work at night but are considered unlikely to cause

disturbance to local residents. Pulling of the pipeline to the landfall may result in a slight increase in normal daytime noise levels, and potentially a significant increase in noise levels in the evening and at night when the landfall site would normally be quiet. This activity is expected to last for a short period (one week) and therefore impacts will be short-term. Underwater excavation work in Broadhaven Bay will involve re-excavation of the previously infilled trench. This activity will not generate noise at levels that will have any more than a negligible and temporary impact on the receiving environment.

Onshore Corrib Gas Pipeline

The Onshore Pipeline is predicted to result in significant although temporary negative noise impacts during construction as a result of machinery, excavation and traffic.

Cumulative Impact

During construction there will be increased noise from construction works and traffic associated with each of the elements of the project. In terms of cumulative impacts only works associated with the construction of the Terminal and Onshore Gas Pipeline could give rise to cumulative noise impacts. However, as the Terminal site is remote few if any cumulative impacts would occur from construction works. Furthermore, as works are anticipated to take place in late 2009 and 2010, the majority of works at the Terminal will relate to mechanical and electrical works and will therefore have less of a noise impact.

As increased traffic associated with the completion of the construction of the Terminal and Onshore Gas Pipeline will occur simultaneously, there will be potential for cumulative noise impacts along the local road network. However, these impacts which will be moderate and temporary in nature, will be limited to working hours and will be further managed through the implementation of a Traffic Management Plan (see Appendix F).

17.3.3.6 Visual Impact

Bellanaboy Bridge Gas Terminal

The Gas Terminal is predicted to result in minor temporary visual disturbance as a result of construction activities including the presence of large plant and cranes.

Peat Removal and An Srath Mór (Srahmore) Peat Deposition site

During construction short term adverse visual impacts are associated with peat transfer traffic to the An Srath Mór (Srahmore) Peat Deposition Site.

Mayo to Galway Gas Pipeline

The Mayo to Galway Pipeline resulted in minor short-term visual impacts during construction as a result of site facilities and working widths.

Offshore Development

The Offshore Seabed Installation (nearshore component) will result in short term adverse visual impacts on highly scenic views as a result of temporary activity within the nearshore areas of Broadhaven Bay including the mooring of a large pipelay vessel, workboats, etc. Similarly, short term adverse visual impacts will result from construction activity in the vicinity of the landfall including the beach.

Onshore Corrib Gas Pipeline

The Corrib Onshore Pipeline is predicted to result in substantial negative impacts that are temporary in nature as a result of construction activities. This is because the viewer sensitivity is high for the protected views designated along the scenic routes in the area.

Cumulative Impact

Construction activities associated with all elements of the project will result in localised temporary moderate visual impacts. However, cumulative visual impacts will be limited to the overlap in construction of the onshore pipeline and Terminal in late 2010. However, these sequential impacts will be temporary in nature. There will be no increased cumulative visual impact resulting from peat deposition at An Srath Mór (Srahmore) as it is located sufficiently away from the other elements of the Corrib Gas Field development.

17.3.4 Natural Environment

17.3.4.1 Terrestrial Ecology

Bellanaboy Bridge Gas Terminal

The Gas Terminal was predicted to result in short-term negligible or minor impacts on terrestrial flora and fauna during construction as a result of vegetation clearance and disturbance to habitats of low ecological interest.

The Terminal site covers an area of approximately 160 hectares but only habitats under the terminal footprint, access roads and some small drainage channels are permanently lost (13ha). Habitats affected include grassland, immature conifer plantation and small pockets of scrubland.

Peat Removal and An Srath Mór (Srahmore) Peat Deposition site

The An Srath Mór (Srahmore) Peat Deposition Site was predicted to result in a number of temporary impacts on terrestrial flora and fauna during construction as a result of disturbance, including temporary loss of habitat.

Approximately 450,000m³ of peat excavated from the Terminal site was deposited in a cutover peatland at An Srath Mór (Srahmore). A further 75,000m³ of peat will be disposed of at An Srath Mór (Srahmore) as a result of construction of the Onshore Pipeline. Deposition of the peat takes place within an area of approximately 63 ha.

This site is one from which peat has been harvested for a local power station and is saucer shaped with an extensive drainage infrastructure that was installed for industrial peat extraction. On completion, the site has been allowed to recolonise by natural species. This promotes the re-establishment of peat-forming conditions and re-instates a peatland ecosystem in place of the original Atlantic blanket bog complex. The vegetation succession will lead to a more varied habitat which will contribute to local biodiversity and complement the ecological significance of the adjacent rehabilitated cutover areas. Over time the habitats will blend with the existing fringe habitats that currently border the development site. The long term prospect is therefore considered to be positive, with permanent beneficial impacts on the development site. The residual impacts overall are considered to be significantly positive given that they should result in habitat rehabilitation and increased local biodiversity.

Mayo to Galway Gas Pipeline

The Mayo to Galway Pipeline was predicted to result in temporary short-term impacts on terrestrial flora and fauna during construction as a result of disturbance. Short term impacts on fauna were limited to the working area, with works timed to minimise disturbance. Potential impacts on flora were minimised through route selection and appropriate construction and re-instatement techniques.

There were six Block Valve Installations (BVIs) along the 150km Galway to Mayo pipeline route, the site areas of which are estimated to be approximately 35m x 35m, except for BV4 (see Table 17.4) which incorporates a pigging station and requires an area of approximately 50m x 50m. This required the permanent loss of the following habitats at each Block Valve Installation (BVI):

Table 17.4 Habitats at Block Valve Installations

Station	Habitat Type
BVI 1	Mixed cutover bog and conifer
BVI 2	Cutover rushy grassland
BVI 3	Improved grassland and hedgerow / scrub
BVI 4	Improved agricultural land
BVI 5	Agricultural land
BVI 6	Agricultural land / stone wall

In addition to permanent habitat loss due to the six BVIs, approximately 13km of the Galway to Mayo Pipeline traversed conifer plantations, which were required to be felled. As the pipeline working width was 40m this meant that there was a permanent removal of approximately 52ha of conifer trees. Conifer felling should be seen in the context of local forest management which has seen extensive (ongoing) clearfelling of large areas of mature conifer plantation in recent years. The felling of trees for this pipeline should be viewed as an extension of the forest management in the area, as the mature conifers would be due for felling in rotation.

Offshore Development

The work required to install the offshore pipeline is relatively minor, and the route through the cliff at the landfall will be re-instated fully following construction. No long term impacts on any species are predicted.

Seabed disturbance from the installation of the field facilities resulted in permanent habitat loss of benthic faunal communities and crustaceans over a footprint of 392m² of the seabed (combined footprint for the gathering manifold and pipeline end manifold).

Installation of the pipeline and umbilical on the seabed will result in a permanent loss of benthic habitat. The total seabed area actually taken up by the offshore pipeline once laid is approximately 4.28ha. Increased turbidity during construction and smothering of organisms underneath the pipeline will result in permanent but minor habitat change. Within Broadhaven Bay, both the pipeline and the umbilical will be trenched for approximately 13km from the landfall site and therefore no permanent habitat loss will occur.

Onshore Corrib Gas Pipeline

The impact of the proposed Onshore Pipeline on terrestrial ecology in the area is considered neutral or slight negative in the long-term as a result of disturbance during construction. No long-term significant impacts on species of conservation interest present on site, such as otters, badgers, bats and frogs are expected.

Permanent loss of habitat of the onshore pipeline occurs at the LVI, along the access road to the LVI and the tree felling of conifers. This represents approximately 3.5ha. Again, the felling of trees for this pipeline should be viewed as an extension of the forest management in the area, as the mature conifers would be due for felling in rotation.

Cumulative Impact

Construction activities associated with all elements of the Project will result in temporary slight negative impacts on terrestrial ecology. However, these impacts will not be additive in terms of temporary loss (i.e. in combination they do not result in a greater impact) on ecological resources such as SAC or natural habitats. Overall as peat deposition at An Srath Mór (Srahmore) will result in habitat rehabilitation and increased local biodiversity, it will result in a positive impact on terrestrial ecology, which will add to the overall cumulative impact.

Approximately 74ha of permanent habitat loss will be associated with the various elements of the Corrib Gas Field Development. The impacts from the loss outlined will not be additive (i.e. in combination they do not result in a greater cumulative impact) on ecological resources such as SAC or natural habitats. In addition it should be noted that the peat deposition site at An Srath Mór (Srahmore) can be seen as a positive habitat change and is therefore not included in the overall figure.

17.3.4.2 Freshwater Ecology

Bellanaboy Bridge Gas Terminal

The Gas Terminal is predicted to result in temporary short-term negligible or minor impacts on freshwater aquatic ecology during construction, depending upon the successful implementation of pollution control measures, including run-off control.

Peat Removal and An Srath Mór (Srahmore) Peat Deposition site

The An Srath Mór (Srahmore) Peat Deposition Site was predicted to result in negligible impacts on freshwater aquatic ecology with the implementation of appropriate mitigation measures to control discharges.

Mayo to Galway Gas Pipeline

Discharge of hydrostatic test water into the freshwater aquatic environment as a result of the construction of the Mayo to Galway Pipeline was predicted to result in negligible impacts on aquatic ecology.

Offshore Development

There are no predicted impacts to the aquatic (freshwater) ecology from the construction of the offshore pipeline and umbilical.

Onshore Corrib Gas Pipeline

Residual impacts on freshwater ecology including salmonids are predicted to be slight to negligible impacts post construction.

Cumulative Impact

Construction activities associated with all elements of developments will result in imperceptible or slight temporary impacts on freshwater ecology. Cumulative impacts however will be limited as impacts on aquatic ecology will generally be local to individual elements of the overall development.

17.3.4.3 Marine Ecology

Bellanaboy Bridge Gas Terminal

There are no predicted impacts to the marine ecology associated with the construction phase of the Terminal.

Peat Removal and An Srath Mór (Srahmore) Peat Deposition site

There are no predicted impacts to the marine ecology associated with the peat removal and the An Srath Mór (Srahmore) Peat Deposition site.

Mayo to Galway Gas Pipeline

There are no predicted impacts to the marine ecology associated with the Mayo to Galway Gas pipeline.

Offshore Development

The Offshore Seabed Installation will cause some temporary localised disturbance to the seabed sediments, but it is expected that recovery and recolonisation by benthic communities will occur relatively rapidly. Where rock armour or concrete mattresses is laid on the seabed the new hard substrates may attract new species to the area. Overall, the predicted impact to benthic communities is considered to be negligible.

The water depth in the Corrib Field allows for considerable dispersion of normal noise associated with surface vessel activity. Controls to limit any impacts to marine mammals from the generation of noise during nearshore construction will be implemented, and the construction techniques which will be used do not generate high noise levels. Any effect is likely to be transient and restricted to a behavioral response (avoidance).

Onshore Corrib Gas Pipeline

Assuming the trenchless techniques are employed without any temporary intervention pits, there will be no impact on Sruwaddacon Bay. Should an intervention pit be required during construction, then there remains a potential to cause some disturbance of the seabed predominantly due to altered sediment mobility around temporary structures causing scour and deposition. Allowing for mitigation and coupled with the fact that most of the scour will naturally refill with mobile re-deposited material post construction, the residual impacts are expected to be neutral to negative or imperceptible to slight.

A minor deepening and lengthening of the deeper channel may remain within the lower crossing area could result from a possible surface intervention if required. As the seabed in this area is generally coarse and mobile, the impact of this is considered to be insignificant.

Cumulative Impact

The Offshore Seabed Installation is the only element of the development predicted to impact on marine ecology. In the event that temporary surface intervention is required during tunneling underneath Sruwaddacon Bay, the cumulative impacts are predicted to be imperceptible in the short term.

17.3.4.4 Soils and Geology

Bellanaboy Bridge Gas Terminal

Construction of the Gas Terminal resulted in the excavation of approximately 450,000m³ of local peat and excavation of both weathered and unweathered bedrock. However, there was no predicted negative impact on the geology of the area.

Peat Removal and An Srath Mór (Srahmore) Peat Deposition site

The An Srath Mór (Srahmore) Peat Deposition Site was predicted to have no adverse impacts on soils and geology with the implementation of mitigation measures including appropriate timing of works.

Mayo to Galway Gas Pipeline

The Mayo to Galway Pipeline was predicted to have a number of potential impacts on soils and geology during construction associated with the crossing of peat areas, the crossing of flood plain areas, the crossing of low-lying sand and gravel areas, areas underlain by karstified limestone, and

areas of shallow hard rock. Mitigation measures were identified to minimise such impacts on soils and geology including minimising the length of crossings in these areas.

Offshore Development

The Offshore Seabed Installation (offshore component) is predicted to have minor adverse geological impact, as it is not an area that is known to be especially important in geological terms. The drilling of wells will locally impact the solid geology in the removal of a core of rock during the drilling operation. Locally adjacent to the well site there will be some local impact on the seabed geology, in that cuttings arising from the well drilling operation can be expected to settle near by. Installation of the pipeline and umbilical will disturb the seabed and shallow sub-seabed geology temporarily during the construction phase. The umbilical will be buried and the seabed is expected to return to its present morphology within a matter of weeks after construction.

Onshore Corrib Gas Pipeline

In the short-term, there will be a slight impact due to the localised loss and/or compaction of peaty soils during construction. Once construction has been completed and after the full implementation of the mitigation measures there will be an imperceptible impact on soils and geology.

Cumulative Impact

A number of the individual elements of the project have the potential to result in localised impacts on geology and soils. Any cumulative impacts would not be synergistic, i.e. the combination of these impacts will not result in a more significant impact on soils and geology. Therefore the cumulative impact is considered to be slight.

17.3.4.5 Hydrology and Hydrogeology

Bellanaboy Bridge Gas Terminal

Construction of the Gas Terminal will result in localised minor adverse impacts on hydrology. The most noticeable feature would be the possible decrease in baseflow to the watercourse immediately downstream of the Gas Terminal. However it is anticipated that this impact would be negligible by the time this watercourse reaches the Bellanaboy River.

Peat Removal and An Srath Mór (Srahmore) Peat Deposition site

With the implementation of appropriate mitigation measures to treat and control discharges, the An Srath Mór (Srahmore) Peat Deposition Site results in negligible impacts on watercourses adjacent to the site.

Mayo to Galway Gas Pipeline

The Mayo to Galway Pipeline was predicted to result in negligible adverse impacts as a result of changes to drainage during construction.

Offshore Development

The Offshore Seabed Installation is predicted to result in minor or negligible impacts to the aqueous environment as releases to the environment are both small in quantity and of very low toxicity.

Onshore Corrib Gas Pipeline

In the short-term, there will be a slight impact due to the localised loss and/or compaction of peaty soils during construction. Once construction has been completed and after the full implementation of the mitigation measures there will be an imperceptible impact to the original drainage pattern.

Cumulative Impact

A number of the individual elements of the Project have the potential to result in localised impacts on hydrology and hydrogeology. However, each element is committed to stringent pollution prevention measures that are considered sufficient to address any impacts. Therefore the cumulative impact is considered to be imperceptible.

In terms of impact on habitats arising from the effects of the development on hydrology, no other elements of the Corrib Gas Field Development will result in a potential cumulative impact on the SAC and natural habitats traversed by the proposed Corrib Onshore Pipeline as each of the elements lie within a different catchment.

17.3.5 Cultural Heritage

17.3.5.1 Archaeology

Bellanaboy Bridge Gas Terminal

No impacts on known archaeological sites were predicted as a result of the construction of the Gas Terminal. During earthworks no archaeological features were discovered.

Peat Removal and An Srath Mór (Srahmore) Peat Deposition site

No archaeological features were discovered.

Mayo to Galway Gas Pipeline

No impacts on known archaeological sites were predicted as a result of the Mayo to Galway Pipeline. Possible minor/moderate impacts on unknown sites were identified.

Offshore Development

No impacts on known archaeological sites were predicted as a result of the Offshore Seabed Installation. Possible discovery of unknown archaeological material was identified.

Onshore Corrib Gas Pipeline

The proposed Onshore Pipeline route avoids all recorded archaeological monuments and specific sites of archaeological potential. As a result none of these known or potential archaeological sites will be directly impacted. However, one recorded archaeological site lies adjacent to the temporary working area and four other sites of archaeological potential remain within the temporary working area or lie adjacent to it. As such, these sites are considered to be indirectly impacted by the proposed development. The potential exists to reveal previously unknown and buried archaeological sites in the future as part of an archaeological testing strategy.

Cumulative Impact

As there is potential for unknown archaeological material to be discovered archaeological monitoring has been, and will be, undertaken during construction for all elements to ensure the recognition and recording of any such remains.

As all vegetation clearance and excavation has taken place for all elements of the proposed development except the Onshore Pipeline and no impact on archaeology occurred, no cumulative impacts will arise from the proposed Corrib Onshore Pipeline.

17.3.6 Assessment of Total Greenhouse Gases

An assessment of the cumulative emissions of greenhouse gas emissions arising from the construction and operation of the Corrib Gas Field Development is provided below. This cumulative assessment includes the carbon losses arising from peat disturbance for the Corrib Gas Field Development, details of which are provided in Chapter 8 Appendix G.

Bellanaboy Bridge Gas Terminal

The total greenhouse gas emissions associated with the construction of the Gas Terminal are 43,340 tCO₂eq, of which 6,369 tCO₂eq are due to peat removal to the Srahmore Peat Deposition Site.

Mayo to Galway Gas Pipeline

The total estimated greenhouse gas emissions are presented in Table 17.5 below. Details relating to the construction of the Mayo to Galway Pipeline are limited in the EIS and where data was not available, scaled up construction details from the Corrib Onshore Pipeline have been included.

Table 17.5 Total GHG Emissions of the Mayo to Galway Pipeline

Item	Estimated GHG Emissions (tCO ₂ eq)
Construction Materials	37,764
Metals (pipeline Steel)	86,474
Plant Emissions	1,056
Peat Removal	29,670
Material Transport	3786
Personnel Transport	269
Total GHG Emissions	159,019

Offshore Development

The total greenhouse gas emissions for the offshore element of the project are 98,546 tCO₂eq.

Corrib Onshore Gas Pipeline

The total greenhouse gas emissions for the onshore element of the project are 16,651 tCO₂eq, 2,737 tCO₂eq of which are the carbon losses from peat removal to the Srahmore Peat Deposition site or peat disturbance.

Cumulative Impact

Table 17.6 below provides an estimate of the total greenhouse gas emissions associated with the construction and operation of the Corrib Gas Field development.

Table 17.6 Summary of Total Greenhouse Gas Emissions associated with the Corrib Gas Field Development

Project	Construction Emissions (tCO ₂ eq)	Operational Emissions (tCO ₂ eq)	Total Emissions (tCO ₂ eq)
Offshore Pipeline & Well Installation	98,546	-	98,546
Onshore Gas Pipeline	16,651	-	16,651
Bellanaboy Bridge Gas Terminal	43,340	691,725	735,065
BGE Mayo to Galway Pipeline	159,019	-	159,019
Total	317,556	691,725	1,009,281

Note: 1. Assumes 15 years of Terminal Operations and 46,115 tonnes per year (Chapter 14 Terminal EIS)

From the above figures, the estimated total greenhouse gas emissions including those from carbon losses from the construction phase of the Corrib Onshore Gas Pipeline represent 5.2% of the total estimated greenhouse gas emissions associated with the construction of the Corrib Gas Field Development. The estimated contribution from carbon loss due to peat removal of 2,737 tCO₂eq from the construction of the Corrib Onshore Pipeline represents less than 1% of the total Greenhouse Gas Emissions associated with the construction of all elements of the Corrib Gas Field Development.

17.4 CONCLUSIONS

Table 17.7 summarises the potential cumulative impact for each environmental topic discussed in Sections 17.3.3-17.3.5

Table 17.7: Summary of Potential Cumulative Impacts during the Construction Phase

Environmental Topic	Significance	Duration
Local Employment	Positive	Temporary
Tourism and Recreation	Imperceptible	Temporary
Traffic	Slight	Temporary
Air Quality	Slight	Temporary
Noise	Moderate	Temporary
Visual	Moderate	Temporary
Terrestrial Ecology	Slight to Moderate	Short Term
Freshwater Ecology	Imperceptible	Short Term
Marine Ecology*	Imperceptible	Short Term
Soils and Geology	Slight	Short Term
Hydrology and Hydrogeology	Imperceptible	Temporary
Cultural Heritage	None	n/a
Carbon Loss	Slight	Permanent

* If a temporary intervention pit is required (see Chapter 5).

The above assessment of cumulative impacts on the human environment indicates that the overlap in the construction periods for the Terminal and Onshore Pipeline has the potential to result in cumulative impacts on the local community as a result of increased traffic, noise, dust and visual disturbances. However, these impacts, all of which will be temporary in nature will be minimised with the implementation of mitigation measures.

There will be a positive cumulative impact on local employment. The other elements of the Corrib Field Development have either been completed (Mayo to Galway Pipeline) or in the case of the offshore

works in 2009 will not result in significant cumulative impacts on the local community due to the geographic location of the works.

In terms of cumulative impacts on the natural environment, potential impacts on the freshwater and marine environments will arise during construction. However, as these environments are transient in nature and capable of recovering in the short term no cumulative impacts are predicted to arise. Although the terrestrial environment will take longer to reinstate, the combined impacts of each element of development will not result in a more significant cumulative impact. This is due to the geographic locations of each element of the works i.e. the combined post-construction impacts on the Mayo to Galway pipeline and the Corrib Onshore Pipeline do not give rise to a more significant synergistic impact.

Approximately 74 hectares of permanent habitat loss will be associated with the various elements of the Corrib Gas Field Development. However, the impacts from the loss outlined will not be additive (i.e. in combination they do not result in a greater cumulative impact) on ecological resources such as SAC or natural habitats. Furthermore, it should be noted that since peat deposition was completed at An Srath Mór (Srahmore) from construction of the Terminal, the site has revegetated thus providing additional habitat and reducing the potential for sediment run-off thus having a positive impact on ecology. Areas subject to peat deposition from construction of the Onshore Pipeline, will also be allowed to revegetate thus increasing the positive impact.

The above assessment of cumulative impacts concludes that impacts arising from the operation of each element of the Corrib Gas Field Development will not give rise to cumulative impacts on the human and natural environment. This is because the Terminal is the only element which requires operational activities with the potential for impact. Although the combined impacts during the completion of the construction of the Terminal, and the construction of the Onshore Pipeline and peat deposition will give rise to the potential for cumulative impacts, these will be temporary in nature.