

11 MATERIAL ASSETS

This chapter describes the potential impacts on material assets as a result of the construction and operation of the proposed onshore pipeline and identifies mitigation measures to ameliorate these impacts. For the purposes of this assessment, potential impacts on the following aspects were considered:

- Agricultural and non agricultural properties;
- Development potential and property values;
- Land-use, properties and structures;
- Major utilities (electricity supply, telecommunications, water supply);
- Waste management; and
- Raw materials.

Where relevant, impacts on material assets such as the road network and designated conservation areas are more appropriately described in other chapters of this EIS. Table 11.1 highlights chapters that are relevant to Material Assets.

Table 11.1 Chapters Relevant to Material Assets

Chapter	Title	Assets
5	Construction	Natural Environment and Cultural Assets
6	Community	Cultural Assets of a Social Type
7	Traffic	Road Infrastructure
8	Air Quality and Climate	Terrestrial and Aquatic Environment
9	Noise and Vibration	Terrestrial and Aquatic Environment
12	Terrestrial Ecology	Terrestrial Flora and Fauna
13	Freshwater Ecology	Freshwater Flora and Fauna
14	Marine Ecology	Marine Environment
15	Soils, Geology and Hydrogeology	Natural Resources
16	Archaeology, Architecture and Cultural Heritage	Cultural Assets

11.1 AGRICULTURAL ASSESSMENT AND DEVELOPMENT POTENTIAL

An assessment was undertaken on the impact of the proposed development on both agricultural and non-agricultural related properties and the development potential of these lands.

11.1.1 Methodology - Agricultural Properties

Desktop surveys, field surveys and discussions with landowners were carried out to assess the potential impact on agriculture in the area. The surveys and discussions assessed a number of factors including:

- The current agricultural practice taking place on the lands in and around the proposed development; and
- The level of management currently practiced.

The following publications and documents were considered in undertaking this assessment:

- NRA, 'Guide to Process and Code of Practice for National Road Project Planning and Acquisition of Property for National Roads', March 2003;
- Central Statistics Office (CSO), Census of Agriculture, 2000;
- Ordnance Survey of Ireland (OSI), 1:50,000 and 1:2,500 scale maps; and
- Aerial Photography (2004 and 2006).

The potential effects of the proposed development on agriculture are primarily related to the type of farming practised in the area and the intensity that the enterprise is farmed. The proposed development may affect different farm enterprises as follows:

- Drystock – Drystock farming (sheep, beef and sucklers) is the most common farm enterprise in the vicinity of the proposed route. The animals associated with this enterprise type are generally of a quiet disposition. These animals normally do not require moving on a daily basis.
- Horse - Horses, particularly thoroughbred horses, are of a more nervous disposition than other stock types and are prone to stress caused by unaccustomed noise. There are no farms specialising in breeding horses on the proposed pipeline route, but a number of farms do have sport horses. Construction activities may cause stress due to associated noise levels.
- Forestry – Forestry in the vicinity of the pipeline route near the Terminal site will require clear felling prior to construction. After construction, no replanting of forestry will be allowed within a 14m wide permanent wayleave. Access to forestry plantations will be affected by the proposed pipeline route on a temporary basis.

Table 11.2 shows the classifications for different levels of significance that an impact may have on agricultural material assets. These guidelines are broadly based on the EPA (2002) '*Guidelines on the Information to be contained in Environmental Impact Statements*'; and the EPA (2003) '*Advice notes on Current Practice (in the preparation of Environmental Impact Statements)*' with reference specifically to agricultural enterprises.

Table 11.2 Criteria used for the agricultural impact assessment of material assets (agriculture, and forestry).

Significance of Impact	Criteria
Not significant	The material asset is not affected by the development or the development may encroach slightly on a boundary causing a slight inconvenience.
Minor	Development causes a small inconvenience but does not require a significant change in current management of the material asset. Mitigation would overcome any problems.
Moderate	Development causes a degree of landtake or severance that will cause a change in the management of the material asset or an increase in labour charges or machinery costs. Mitigation measures should overcome most difficulties.
Major	The impact on the material asset would require a significant change in management practices with associated costs due to severance, land take or loss of buildings. This level of impact would require considerable mitigation measures and not all difficulties would be overcome.
Severe	Management of the material asset can no longer continue. No mitigation measures would overcome the impact and allow any operations to continue.

In addition, the proposed development will have an effect on a small area of peatland where turf cutting is practised. Turf cutting will be impacted where construction has disturbed the ground. Access to turf plots will also be affected during construction of the proposed onshore pipeline.

11.1.2 Methodology - Development Potential and Property Values

An assessment of development potential of the study area has been carried out. Development potential is the potential for an area both to accommodate new development, in this instance primarily residential development, and associated with this, the considered likelihood of securing a Grant of Planning Permission from the Planning Authority. The price of undeveloped land reflects in part its potential to successfully attract permission for new development thereon, which in turn depends upon its ability to accommodate such development. On the other hand, the price of an existing dwelling property might reflect the inability of other sites in its vicinity to be developed, thereby limiting housing supply in an area, particularly if that area has a demand for development. Other factors that influence property values include qualitative elements such as an area's attractiveness, remoteness or proximity to local services and community facilities.

A consideration of the development potential of an area therefore is somewhat qualitative and is based upon consideration of external factors, such as development policies and guidelines, and internal factors, such as land quality and suitability, provision of physical infrastructure or its potential provision, and/or the location, type and intensity of existing development in an area.

Consideration and assessment of the potential impact the proposed development may have on property values (residential and possible sites) in the area was carried out by a qualified and experienced Auctioneer from Connaught.

This entailed the following methods:

- Discussions with local Auctioneers and Estate Agents;
- Discussions with Estate Agents in catchment areas of existing Bord Gáis Éireann pipelines throughout Ireland;
- Discussions with Estate Agents and Valuers in Holland working in catchments areas of high pressure and untreated gas pipelines;
- Questionnaires to Irish and Dutch Estate Agents; and
- Site visit to Holland to examine at first hand local markets close to high pressure and raw gas pipelines.

11.2 EXISTING ENVIRONMENT

11.2.1 Agriculture

There are 12,537 farms in County Mayo, utilising approximately 274,560 hectares (CSO 2000). The average farm size is 21.9 hectares. The majority of agricultural lands in County Mayo are involved in specialised beef production. Fifty three per cent of farms in County Mayo are currently participating in the Rural Environmental Protection Scheme (REPS) administered by the Department of Agriculture, Fisheries and Food (DAFF).

The proposed onshore pipeline is approximately 8.3km long. Approximately 4.9km of the proposed route is tunnelled. Of the remaining 3.4km, approximately 0.5km is routed through privately owned land parcels. Most of these lands, which are of good agricultural quality for the region, are in grass and are used for drystock grazing. Approximately 0.5km of the proposed route is through peatland which is used for rough grazing and some turf cutting, and approximately 0.2km is through reclaimed peatland. Approximately 2.2km is through forestry.

11.2.2 Development Potential

The rural housing policies of the Mayo County Development Plan 2008-2014 (Section 4.16) are very clear in respect of development within rural areas such as the study area. Site requirements which must be met to ensure a Grant of Permission for new dwelling development include satisfactory

drainage and traffic safety. Minimising permanent visual impact is also of importance in high amenity areas, particularly on land between a coast road and that coastline, and especially if that coast road is designated as a scenic route. Also of considerable importance is the requirement that planning applications for housing in rural areas must contain a clear demonstration that the applicant has a legitimate right to build within such area, such as a family relationship to the property site, or an established linkage with the area. Therefore, having regard to all these factors, it does not follow that all undeveloped land within an area has the potential to be developed, whether by consequence of its physical characteristics, its location and setting, or by matters of land ownership and tenure.

The development potential of lands can also be constrained by issues relating to the need to provide reservations or exclusion zones associated with the provision of new infrastructure in an area. Often such reservations are associated with a particular Development Plan policy for the provision of new infrastructure in situations where that infrastructure may not be developed for some period of time. For example, a road construction objective, without any specific detail of alignment, or along an indicative alignment, may require the control of development of lands within a wider corridor of that indicative alignment, in order not to constrain eventual provision of any final road alignment; however, the specific alignment of that road may not be determined for some time subsequent to the identification of the wider indicative corridor. Generally, following identification of the specific route of that road, and the necessary wayleave landtake for its construction, the other lands of the indicative corridor outside the specific wayleave revert to their previous development capability, unless specifically prevented from doing so as a consequence of the operation of that infrastructure, for example due to severance from an access point, noise and vibration issues, or similar.

This is also the case with a gas pipeline route, as proposed in this instance. The identification of this route, and any identified necessary temporary and permanent exclusion areas, will function as a temporary or permanent constraint to development potential – subject to the lands within those identified exclusion areas being otherwise appropriate to accommodate development, having regard to the constraints detailed above. The extent of permanent exclusion from future development is defined by the area of the on-land permanent pipeline wayleave – in this case the width of the permanent wayleave is generally 14 metres (and 20m wide in peatland and forestry). Furthermore, potential development in close proximity to a gas pipeline must be controlled on the grounds of public safety, with exclusion areas normally calculated in reference to current pipeline design safety codes. This constraint to development will also occur, for a temporary period, within the identified temporary working area required for construction of the Corrib Onshore Pipeline.

The determination of the development potential of an area in consequence of a proposed infrastructure development is most appropriately based upon the more technical appraisal of potential i.e. where proximate development could safely occur, having regard to technical guidelines. The wider issue of property values in an area includes less tangible issues, such as public and potential purchaser perception, despite whether such perception is accurate.

In the context of all the above, it is considered that the development potential of lands along the proposed route is very limited. Having regard to Statutory and National planning policy, it is considered that development will be strictly controlled within designated conservation sites, such as candidate Special Areas of Conservation (see Chapter 12), or indeed in non-designated habitats containing EU Annex species.

It is also considered unlikely that development will be permitted on backland locations at any significant remove from public roads, which would otherwise require the extension of road and other infrastructure serving such backland development. In addition, the Statutory Plan states that development will be prohibited where horizontal or vertical sight distance is inadequate to allow a safe access from the development or where the creation of a new access near existing junctions or accesses would interfere with the safety and free flow of traffic on the road. Proximity to a road is thus not in itself sufficient to ensure the development potential of a site.

In this regard it is an objective of the Statutory Development Plan to develop infill sites in small towns and other settlements as a means of providing additional housing. The general strategy is to encourage development into settlements where there is a basic nucleus of functions, rather than allowing the more unsustainable spread of development away from existing settlements. This includes appropriate backland development within existing villages, in order to ensure a sustainable cluster

form. However, such backland development cannot always equally be applied to linear settlements, such as along a road, where no such clustering of development can be established.

Arising from this policy to target development into existing settlements, the fact that a site might adjoin a local road is not in itself sufficient to ensure its development potential. In this context, there is no considered significant development potential along the L1202 coast road between that area where the onshore pipeline crosses the local road north of the Gas Terminal at Béal an Átha Buí (Bellanaboy), westwards to the vicinity of the settlement of na hEachú (Aghoos), Poll an tSómais (Pollatomish) and beyond to Gleann an Ghad (Glengad).

11.2.2.1 Property Values

Values of houses in County Mayo in general increase in closer proximity to centres of population for reasons including higher demand, better employment opportunities, better range of amenities and facilities, etc.

Good quality, modern four bedroom bungalows in the study area would up to the end of 2006 have had an average value of approximately €250,000, presuming good views and a standard ½ acre site. Good quality, three bedroomed bungalows/single storey houses in the area on similar sites would have had an average value of approximately €200,000.

This would be roughly in line with other rural areas of County Mayo and the west of Ireland in general. The possible diminution in values of houses in the area because of distance from population centres would be more or less balanced upward because of pleasant views of the sea, river, lake and mountains in the project area.

Residential values in the study area over a 10-year period up to the end of 2006 rose on average 300% and this is in line with other parts of County Mayo and the west of Ireland in general. However, due to a variety of influences on the Irish economy since 2007, the market both locally and nationally has softened. Houses are at present harder to sell and in some cases values have fallen 30 to 40% from the values of late 2006.

Sales of sites for residential development are very limited due to policies for restriction on such development contained in the Mayo County Development Plan 2008-2014, as detailed previously. These policies are consistent with the provisions of the Rural Housing Guidelines for Planning Authorities published by the Department of the Environment, Heritage and Local Government. Where a new site is considered appropriate to accommodate a dwelling development, it is generally issued with a condition restricting occupation in the short and medium terms to the owner of the dwelling, being the Applicant for the Permission. This presumes against sites being developed for commercial gain but rather for local need.

Special attention has been paid in this assessment to sale trends in the study area. Since 2007 a number of properties remain unsold. A number of possible reasons exist for this, including unrealistic price guides, and the national trend of slowdown in property sales.

11.3 POTENTIAL IMPACTS

11.3.1 ‘Do Nothing’ Scenario

11.3.1.1 Agriculture

If the proposed development did not proceed current agricultural practice would remain unchanged in the onland area of the proposed onshore pipeline development at Gleann an Ghad (Glengad) and na hEachú (Aghoos).

11.3.1.2 Development Potential and Property Values

If the proposed development did not proceed, the development potential of the area would remain unchanged subject to any revision of the National or County Development Plan.

If the proposed development did not go ahead property values would continue to fluctuate in line with county/country levels.

11.3.2 Agriculture

11.3.2.1 Landtake and Severence

Whilst every effort has been made to minimise the impact on agriculture, approximately 5 hectares of privately owned good quality agricultural land in Gleann an Ghad (Glengad) will be removed from production for a short term during the construction and reinstatement stage of the proposed development. Approximately 17 hectares of agricultural land used for rough grazing in na hEachú (Aghoos) will be removed from production for a short term during the construction and reinstatement stage of the proposed development

Fencing will be required during the construction stage, which will be maintained, as appropriate, during reinstatement. More detail on the types of fencing to be used is provided in Chapter 5.

Approximately 0.5 hectares of farmland will be required for the LVI (and permanent access road) at Gleann an Ghad (Glengad). This land is in the ownership of SEPIL.

Approximately 4.0 hectares of forestry will not be replanted within the permanent wayleave along the proposed route.

A number of land parcels in Gleann an Ghad (Glengad) will be severed during construction of the proposed development on a short term basis. Access to forestry blocks will be affected during construction of the proposed development on a short term basis.

11.3.2.2 Other Potential Impacts

Noise associated with construction can be an issue with certain types of livestock such as horses. But as horses are regularly seen grazing alongside construction sites in this country the impact is unlikely to be significant.

Livestock are at risk to eye irritations from high levels of wind blown dust particles.

There will be an increase in traffic during the construction phases of the proposed development, which has the potential to cause nuisance to agricultural traffic.

Field drainage systems currently in situ may be disturbed and in places disabled during construction. This disturbance may lead to wet or flooded fields during spells of wet weather, with farm productivity potentially reduced.

The construction of the proposed onshore pipeline development may disturb water supplies for livestock in fields and properties in Gleann an Ghad (Glengad).

Pipeline construction is a linear development and therefore has the potential for carrying disease between fields and farms.

11.3.3 Development Potential

Potential impact from the proposed onshore pipeline on development potential can clearly only occur where such development potential actually exists. Having regard to designated conservation sites and habitats in this area, as well as the statutory policies and guidelines for development in rural areas, it is considered that such potential only occurs within the settlement areas of Gleann an Ghad (Glengad) / Poll an tSómais (Pollatomish) and na hEachú (Aghoos), along the L1202, rather than directly along the alignment of the proposed onshore pipeline, which is set adjacent to the coastline some distance from the public road. It is not considered that the proposed development will have any impact upon the existing development potential – primarily infill development – along the linear extent of the existing settlements.

The proposed development requires the removal from use of one existing habitable dwelling, situated on the L1202 coast road in the townland of na hEachú (Aghoos). This property is in the ownership of SEPIL and as such there is no impact upon the development potential of a third party.

11.3.3.1 Property Values

As this is a linear development, the potential impact will vary at different locations during the construction stage. The construction of the proposed development will have a moderate, temporary negative effect on the saleability of residential properties if they were to be offered for sale during the course of construction of the development. This potential impact will affect properties within sight of the proposed works or located along roads, which have construction traffic passing back and forth on a daily basis, or where normally scenic views are temporarily obstructed by construction activity.

Research carried out in Holland indicated there are no significant changes in the environmental character or loss of amenity associated with the operation of high pressure and 'raw' gas pipelines and associated facilities. Similarly, in Ireland there are no significant changes in environmental character or loss of amenity due to the development and operation of existing gas pipelines.

There may be a perceived impact that living close to the proposed development may affect property values. Once construction is completed, the property market will gradually return to normal trends, similar to whatever trends may be experienced at a provincial and national level, with house prices determined by demand and supply. Demand is expected to remain consistent for the limited supply of quality properties within this scenic coastal location.

11.4 MITIGATION MEASURES

11.4.1 Agriculture

The following measures are proposed to mitigate against the potential impacts identified in Section 11.3.

11.4.1.1 Landtake & Severance

- Permanent landtake, permanent loss of areas for harvesting timber and temporary loss of areas for grazing or grass harvesting will be dealt with by compensation. Matters of compensation do not form part of the EIS.
- All agricultural lands will be re-instated to pre-construction conditions subject to the agreement of the landowners. In designated conservation sites, reinstatement will be subject to approval of NPWS (see Chapter 12).
- Where necessary, suitable stock proof temporary fencing will be erected for the duration of construction, which will include re-instatement.
- Where any fences, walls or hedges are damaged they will be made stock proof immediately, where necessary. Any necessary permanent restoration of fences, walls, drains or land will be completed as soon as practicable after work has concluded.
- During the construction stage the contractor will be instructed that any gates used by them are closed so as to prevent animals from straying.
- Existing accesses to property, including homes, farms and forestry blocks will, where practicable, be maintained during construction, otherwise reasonable temporary access will be provided.

11.4.1.2 Other Mitigation Measures

- Discussions will take place with landowners who are concerned that noise levels, dust or traffic interference from construction is causing a disturbance to their stock. Mitigation measures regarding traffic, air and noise are outlined in the Chapters 7, 8 and 9 of the EIS.
- All drainage likely to be affected or disturbed during the construction phase will be identified and reinstated quickly and properly. Any damage to crops and soils by flooding will be rectified and/or compensated.
- Any disruption to water supply will be reinstated immediately or an alternative source supplied until the source is reinstated.
- All machinery coming from outside Ireland will be cleaned and disinfected on entry to the country.
- When required, machines will be sprayed with appropriate disinfectant prior to arrival on site. The contractor will verify to the Agricultural Liaison Officer (ALO) that this has been done.
- The ALO will liaise with the local District Veterinary Office (DVO) to establish the location of any restricted herds along the route of the proposed development. The liaison will continue on a regular basis throughout the construction and reinstatement periods.
- Where the ALO has been informed of a restricted herd along the route, all machinery and personnel will be disinfected appropriately before leaving the land concerned. The number of accesses across the working strip will be reduced to one in the case of lands having restricted herd status. The contractor will arrange for disinfectant mats/baths to be replenished with disinfectants, as required.
- In the event of an outbreak of a serious Class A Disease, the project will be subject to such operational restrictions as are imposed by the Department of Agriculture, Fisheries and Food.

11.4.2 Development Potential and Land Values

As noted in Section 11.3, it is considered that there is no development potential along the specific route of the proposed onshore pipeline, or those coastline backlands to the north of the alignment of the L1202. Development potential will continue to occur within the existing linear roadside settlements of the area, and in particular, along the L1202 coast road. As such, no potential impact arises in this respect, and thus no mitigation measures are necessary.

The proposed development will result in the removal from use of one house in the area of na hEachú (Aghoos), which is in the ownership of SEPIL (see Section 11.3.3). No mitigation measures are required to reduce such impact on the development potential and land value of this area.

11.5 RESIDUAL IMPACT

11.5.1 Agricultural

The proposed development will have a minor, long term residual impact at the LVI due to loss of land for production. The proposed development will have a moderate, long term residual impact on forestry production within the permanent wayleave. The residual impact on the remaining lands used for grazing and grass production will be short term and minor.

11.5.2 Development Potential

There will be no significant impact on development potential, having regard to the specific alignment of the proposed onshore pipeline development – at some remove from the existing L1202 coast road, and having regard to the fact that development potential is effectively restricted to infill and other development along the roadside settlements thereon.

11.6 NATURAL AND OTHER RESOURCES

An assessment was undertaken of the impact of the proposed development on the infrastructure (including utilities and waste management) and raw materials in the vicinity of the proposed onshore pipeline route. The potential impact assessed is that which is considered most likely to occur during the construction phase. There will be no significant impact during the operation phase.

11.6.1 Methodology

A desktop assessment was carried out to determine the infrastructure and utilities in the study area. With regard to utilities information, the following service providers were consulted to obtain details of their services within the area of the proposed development:

- Electricity Supply Board;
- Eircom; and
- Mayo County Council.

Quantities of resources to be used during the construction phase were also estimated.

11.6.2 Existing Environment

11.6.2.1 Utilities

Electricity Supply

The electricity supply network in the vicinity of the proposed route predominantly consists of overhead cables. The network may run underground at certain locations, particularly where a service enters a private dwelling. There are locations where the proposed pipeline will have to traverse the existing overhead/underground electricity supply network.

Telecommunications

The telecommunications network in the vicinity of the proposed route predominantly consists of overhead cables. The network runs underground at certain locations. There are locations where the proposed pipeline may have to traverse the existing overhead/underground telecommunications network.

Water Supply

The water supply on the southern side of Sruwaddacon Bay is fed by a group water scheme which is supplied from Carrowmore Lake. The water supply system in the area is made up of small bore pipe work, which mainly follows the road network. Water supply sources will be protected from any potential effects of the proposed construction phase of the development by implementing a Surface Water Management Plan, Pollution Control Plan, Waste Management Plan and Hazardous Substance Management Plan included in the EMP as outlined in Chapter 5 of the EIS.

Sanitary Services

It is understood that each property has its own individual on-site wastewater treatment system in the area of the proposed route.

Lighting

Public lighting exists close to settlement clusters and is typical of similar rural areas in Ireland. There is no public lighting in the areas close to the proposed site compounds in Gleann an Ghad (Glengad) and na hEachú (Aghoos) including the site of the tunnelling compound at na hEachú (Aghoos).

11.6.2.2 Waste Management

The management of wastes arising in County Mayo, which is part of the Connacht Region, follows national waste policy and is described in the Regional Waste Management Plan. The current Plan runs from 2006 to 2011 and aims to reduce the amount disposal to landfill through an increase in recovery and recycling options. The Regional Waste Management Plan contains extensive policy objectives for the management of key waste streams including household waste, commercial waste, construction and demolition wastes and priority waste streams. Each Local Authority in the Region is responsible for implementing the objectives of the Plan in their functional area and ensuring that the sustainable strategy for managing wastes is delivered.

There are a number of permitted waste management facilities in the region which could accept the types of waste material generated from the construction works, most of which will be inert waste. There are restrictions on how much inert waste each of these facilities can accept, depending on their waste permit/licence.

11.6.2.3 Raw Materials

Raw materials required during construction of the proposed onshore pipeline will be sourced from local suppliers, where suitable, this may include the use of stone from local quarries and general construction materials. There are a number of quarries in the locality from which material such as stone can be sourced. However some specialised materials that cannot be sourced locally, such as the pipeline, services and the concrete segments to be used in the tunnel, will be imported.

11.6.3 ‘Do Nothing’ Scenario

11.6.3.1 Utilities

If the development does not proceed there will be no impact on existing utilities in the area.

11.6.3.2 Waste Management

If the development does not proceed there will be no waste generated.

11.6.3.3 Raw Materials

If the development does not proceed no raw materials will be required.

11.6.4 Potential Impacts

11.6.4.1 Utilities

The potential for the proposed development to impact or interrupt utility supply has been assessed. There is limited potential for interaction between the local utilities and the construction of the proposed onshore pipeline, and therefore the potential for interruption to local utility supplies is limited.

It is expected that all utilities in the area will remain operational for the duration of the construction period. Any utility affected by the construction of the onshore pipeline will be quickly reinstated and made fully operational without delay. Due to the alignment of the proposed route, the proposed onshore pipeline generally avoids local utilities. However, care will be exercised at locations such as site entrances from the L1202 and at the point where the proposed pipeline crosses the L1202.

Electrical Supply:

In general the proposed construction works will be self contained with respect to power. Power will be provided as follows:

- Electrical requirements for construction, e.g. for tunnelling, welding, site lighting, heating of site offices, will be provided by diesel generators.

- All construction plant and machinery will be powered by diesel engines. It is estimated that approximately 9,000 litres of diesel will be required daily to power generators associated with the tunnelling works.

During operation, electrical power will be required on a permanent basis for the instrumentation and control systems, lighting, CCTV and the intruder detection system at the LVI. This will be provided through a connection to the local electricity grid at Gleann an Ghad (Glengad). The LVI will also be fitted with an uninterruptible power supply (UPS) and connection point at which a mobile generator can be connected to provide power during periods when the network is down.

Telecommunication

There is an existing telecommunication connection at the Terminal site which will be used throughout construction of the proposed onshore pipeline. If required, a link will be established to include the site compounds in na hEachú (Aghoos) and Gleann an Ghad (Glengad).

Water Supply

Water will be required for certain activities, such as cleaning plant and machinery and portable lavatories/welfare facilities, throughout the construction process. Water will be sourced from the Terminal site or the tunnelling compound in na hEachú (Aghoos) for these requirements. Cleaning of plant and machinery will take place in designated areas where runoff will be contained.

Significant amounts of water will be required for the construction of the tunnel. Water required for the construction process will be sourced from the Terminal site. Rainwater harvesting will also be carried out at the tunnelling compound in na hEachú (Aghoos) and reused, where possible, during construction.

If any additional water should be required, it is proposed to source this from the local water treatment works operated by Mayo County Council at Barnatra.

The proposed management of water requirements for the tunnelling project are detailed further below.

Water for tunnelling

A drilling fluid consisting of a mixture of bentonite and water is required for the tunnelling process (see Chapter 5). This mixture will need to be replenished on a continuous basis.

Although the bentonite slurry will be continuously recycled and reused, it is estimated that an average of 150m³ of fresh water per day will need to be introduced into the system to compensate for losses. It is proposed that the primary source of this water will be from rainwater harvested within the tunnelling compound. Additional quantities of water will be sourced from the Terminal site, if required.

Water is also required for producing the grout used to seal the annulus between the outside wall of the tunnel and the excavated surface of the surrounding ground and the grout used to fill the tunnel following installation and hydrostatic testing of the proposed pipeline.

Water for hydrostatic testing

Once the proposed pipeline and services have been installed, the pipeline will be filled with freshwater for a pressure test, called a hydrostatic test (see Chapter 5). It is estimated that approximately 2,500m³ of water will be required for the hydrostatic testing. It is proposed that this water is sourced from the Terminal site and/or rainwater harvesting at the tunnelling compound at na hEachú (Aghoos). Additional water quantities, if required, will be sourced from the water treatment plant in Barnatra.

Lighting

During construction, lighting of temporary working areas and site compounds during periods of darkness will be minimised to that necessary for security and safety reasons. However, as tunnelling

will be continuous, night-time lighting will be required at the tunnelling compound, pipe stringing area and associated access roads in Na hEachú (Aghoos).

Lighting will be installed at the LVI site for the operational phase, however the site will not normally be lit. Lighting will only be required if non-routine activities take place during hours of darkness. There will be no other permanently installed lighting along the proposed pipeline route.

11.6.4.2 Waste Management

The majority of waste materials generated during construction will be inert. Small quantities of hazardous waste will be generated, but will be managed carefully and disposed of to suitably licensed waste facilities in line with best practice. Potentially hazardous materials will be managed according to a Hazardous Substance Management section of the Waste Management Plan, which will be included in the EMP for construction.

The following waste streams will arise from construction:

Non-Hazardous Solid Wastes

The bulk of non-hazardous waste streams generated on the project are the arisings from the tunnelling process, surplus peat displaced during the stone road construction in forestry and peatlands as well as construction related waste associated with the demobilisation of site compounds.

Tunnelling Material

The proposed tunnelling works will generate materials predominantly made up of rock cuttings and stone, sands and gravels, with lesser quantities of silts and other residual materials.

The excavated tunnelling materials will be pumped from the cutting head of the tunnel boring machine (TBM) to the start pit in na hEachú (Aghoos) where they will pass through a separation plant. A drilling fluid consisting of a suspension of bentonite in water will be used to aid the pumping of materials from the TBM.

Having passed through the separation plant it is expected that a large portion of the materials, with the exception of silts, can be classified as a Class 1 material in accordance with the NRA Design Manual for Roads and Bridges (DMRB), Specification Series 600 Earthworks i.e. as suitable material for granular fill structures. The recovered materials will be segregated and stockpiled in areas designated for this purpose adjacent to the separation plant. These storage areas will be sized to ensure they can adequately cater for the amount of material arising from the tunnelling process.

The recovered excavated material is estimated to contain a residual concentration of 0.4 per cent bentonite (by weight). As bentonite is a natural material the trace quantities in the excavated tunnel materials are not considered as a contaminant, a view confirmed with the EPA (see Appendix S4).

Inert materials generated from the tunnelling works will be managed sustainably and in accordance with best practice as set out in National and Regional Waste Policy. The strategy for the management of materials generated from the tunnelling process will be in accordance with waste policy as follows:

1. Reuse On-Site;
2. Reuse Off-Site;
3. Recovery Off-Site; and
4. Disposal Off-Site.

Where possible, these materials will be reused during construction of the proposed onshore pipeline. Areas of the development where it is proposed to reuse this material include:

- Pipe stringing area;
- Stone road;
- Pipe bedding; and
- Permanent access road to LVI.

Materials generated by the tunnelling works not required for the onshore pipeline construction could be utilised in local construction projects. Should it not be possible to identify such projects, the material could be used in local quarries for landscaping or land remediation purposes, or processed for subsequent recovery. Material which cannot be reused on-site or reused or recovered off-site at a suitable location/facility will be disposed of at an appropriately authorised waste facility, such as a municipal or inert waste landfill.

Potential options for off-site management of materials arising from the tunnelling process are evaluated further in Appendix S4.

It is estimated that 68,000m³ of material will arise from the tunnelling process. In addition, it is estimated that 7,000m³ of rock cuttings and stone will arise from the construction of the LVI. It is expected that at least 35% of these materials can be reused during construction of the Corrib Onshore Pipeline. Silts and clays have limited reuse potential and are expected to require disposal at an EPA Licensed facility.

Bentonite

Spent bentonite recovered at the end of the tunnelling process is estimated at approximately 200m³ in total. This is likely to require disposal if an alternative use for this material is not identified and, if so, will be disposed of in an appropriately licensed landfill facility (see Appendix S4).

Peat

As set out in Chapter 5 peat will be excavated from the tunnelling compound site at na hEachú (Aghoos), and along the pipeline route in areas of peatlands and forestry.

It is estimated that up to 75,000m³ of surplus peat will be generated and disposed of at the Srahmore Peat Deposition Facility (see Volume 3 of this EIS).

Approximately 15,000m³ of the peat removed at the tunnelling compound in na hEachú (Aghoos) will be stored on site and reused to reinstate the area after construction.

In the areas of forestry, where the pipeline is proposed to be constructed within a stone road, it is proposed to store excavated peat separately within the temporary working area by 'side casting' and spreading where necessary. Any surplus peat will be removed from the temporary working area and deposited at the Srahmore Peat Deposition Facility.

In the area of blanket bog east of the Leenamore River, the upper layer of peat will be turved and the turves stored locally on bog mats before being used for reinstatement. Surplus peat will be removed to An Srath Mór (Srahmore).

Additional Construction Related Material

Additional materials will be generated on the project through demobilisation and reinstatement of the site compounds and the temporary working area. The materials generated from this process will include the following;

- Surface dressing / tarmacadam from the tunnelling compound and the stringing area in na hEachú (Aghoos); and
- Some stone material from site compounds and the stone road.

These materials will be removed off site for reuse, recovery or disposal at a licensed facility. It is estimated that approximately 45,000m³ of these types of waste materials will arise.

Other

Other non-hazardous solid wastes that will arise throughout the construction phase of the proposed onshore pipeline include those outlined in the Table 11.3.

Table 11.3 Other types and sources of non-hazardous solid waste

Waste Type	Source
Green Waste	Shrub / hedge clearance, waste bog mats.
Scrap Metal	Pipe ends or off cuts, swarf (from bevelling).
Paper and Cardboard	Packaging, office waste.
Food Waste	Site canteens.
Plastic	Packaging, HDPE pipe cut offs, geotextile / geogrid.
Miscellaneous	Litter and general Construction & Demolition waste.

These will be collected/contained and transferred to a designated area on-site where they will be stored in separate containers/areas for collection by a local waste contractor for recycling, reuse or disposal. Each collection from the site will be carried out by an appropriately permitted waste operator and transferred to an appropriately licensed or permitted waste facility. A record of each collection will be retained.

It is anticipated that these wastes can be managed with minimum difficulty and potential for environmental impact.

Non-Hazardous Liquid Wastes

Non-hazardous liquid wastes include:

- Sanitary waste (from portable lavatories/welfare facilities);
- Water from washing/cleaning facilities, water run-off from the construction site; and
- Water used during hydrostatic testing.

Sanitary Waste

Welfare facilities and portable lavatories will be made available for staff at all site compounds and at key locations within the temporary working area, if necessary. These facilities will include tanks for storing sanitary waste.

No treatment or discharge of sanitary waste will occur on site. Sanitary waste will be collected on a regular basis by an appropriately permitted waste operator and transferred to an appropriately licensed or permitted waste facility for treatment.

The quantities of sanitary wastes arising from the site compounds will be directly related to the number of people on site.

Water

Water recovered from tunnelling spoil

An average of 150m³ of fresh water is required on a daily basis during tunnelling operations. The separation process for tunnelling spoil is estimated to produce an average of 50m³ of wastewater per day requiring disposal. The remaining 100m³ will be used during tunnelling operations (see Chapter 5). Wastewater will be disposed of at a licensed wastewater treatment facility.

Water for hydrostatic testing

It is proposed that the used hydrostatic test water will be filtered and disposed of offshore via the water outfall pipe in consultation and agreement with relevant statutory bodies, including the Department of Communications, Energy and Natural Resources.

Hazardous Wastes

A Hazardous Substance Management section will form part of the Waste Management Plan included in the EMP for construction.

It is expected that only small quantities of hazardous waste will be generated during construction. Potential hazardous wastes include waste oil/fuel, contaminated materials such as rags and consumable machine/plant items such as filters.

In the event of a contaminant spill, used spill kit materials, i.e. absorbent pads / granules and oil booms as well as recovered contaminated soils will be classified as hazardous waste.

Hazardous waste generated on site will be placed in a sealable container and stored in a designated and appropriately bunded area prior to collection. Hazardous waste will be collected by an authorised carrier of hazardous waste and disposed of or treated at an appropriately licensed facility.

Spent radio isotopes generated from radiographic examinations of pipe welds will be retained by the specialist contractor and disposed of in accordance with the terms of their licence from the Radiological Protection Institute.

Waste Generation during Operational Phase

There will be no waste material generated during the operational phase of the proposed development apart from that arising from routine maintenance carried out at the LVI. Waste generated from these activities will be minimal and will be disposed of accordingly.

11.6.4.3 Raw Materials

The sourcing of raw materials during the construction of the proposed onshore pipeline will have a potential imperceptible impact on the quantities of natural and other resources available. The quantities of raw materials required for the development will be minimised, where possible, through the reuse of materials generated during construction.

There will be minimal requirement for raw materials during the operational phase of the development.

Natural Resources

Stone material will be used to construct temporary access roads, temporary working areas and compounds, as well as the stone road proposed for areas of the route traversing blanket bog and forestry. Where possible, material excavated from the tunnel and the LVI site will be used to construct the onshore pipeline. Stone material will also be sourced from local quarries. It is estimated that approximately 120,000m³ of quarry stone will be required for the construction of the proposed onshore pipeline (see Appendix R).

Bentonite for tunnelling will be imported and mixed with water on-site to the required consistency. It is estimated that up to approximately 4,000m³ of bentonite will be required. The quantity of bentonite required will be minimised through the recycling of drilling fluid. Bentonite will be treated as a hazardous material and will be stored and handled within a contained unit. As set out previously, surplus bentonite following completion of tunnelling will be removed and disposed of at a licensed landfill facility.

Water will be required for a number of activities carried out during construction, such as tunnelling operations, hydrostatic testing, welfare facilities and washing / cleaning plant and machinery.

Other Resources

Concrete will be required throughout construction e.g. at the LVI, for construction of parts of the tunnelling compounds such as the start and reception pit, continuous grouting of the tunnel annulus during tunnelling activities, and final grouting of the tunnel bore. Concrete will also be required for road crossings. Concrete will be delivered to site as readymix in the initial stage of construction, i.e. during site compound set-up. Cement will be delivered and mixed on site for use as grouting material.

Poured concrete will be contained on site and run-off to nearby watercourses will be avoided. Waste concrete is classified as a construction and demolition waste and will be transported to an appropriately licensed facility for recycling or disposal.

Concrete segments for the tunnel lining will be manufactured off site and delivered to the tunnelling compound in na hEachú (Aghoos), when required.

Engineering materials (including bog mats, geotextiles/geogrid steel sheet piles and other piling systems) will also be imported.

11.6.5 Mitigation Measures

11.6.5.1 Utilities

The following mitigation measures will be implemented to prevent or minimise impact on utility supplies:

- All utilities will be identified prior to construction. Liaison with the relevant authority and utility company will be carried out to establish the exact location of all utilities in the vicinity of the onshore pipeline route. Up-to-date drawings will be obtained and a site visit with the relevant party will be carried out if deemed necessary.
- In the event that any utilities will 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.
- The contractor carrying out the works will have knowledge of the types of utilities that will be encountered during construction.
- Utility locating devices will be used, where necessary, during construction of the onshore pipeline.
- Safe digging practices will be used when working around underground utilities.
- Suitable precautions will be taken in the vicinity of overhead cables, i.e. warning signs and installation of 'goal posts' where necessary, i.e. at areas such as entrances to site compounds in Gleann an Ghad (Glengad) and na hEachú (Aghoos).
- A 24 hour emergency contact number for the relevant authority or utility company will be readily available on site.
- A Utilities Management Procedure will be included in the EMP for construction.

11.6.5.2 Electricity

- Diesel generators will provide power on site. Diesel fuel will be managed carefully to ensure that the risk of spillage is minimised. The management of diesel will be included in the EMP for construction.

11.6.5.3 Water

- The use of water during the construction process will be controlled and minimised, where possible.
- Where possible, water will be sourced from the Terminal site or from rain water harvesting at the tunnelling compound in na hEachú (Aghoos). Alternatively, water can be tankered in from other sources (e.g. water treatment plant).
- Water run off will be managed in accordance with a Surface Management Plan and Pollution Control Plan which will be included in the EMP for construction.

11.6.5.4 Lighting

- Lighting of temporary working areas and site compounds during periods of darkness will be minimised, where possible.
- There will be a number of high structures within the tunnelling compound in na hEachú (Aghoos) which will be equipped with beacon lights to alert low-flying birds to their presence. The beacons shall emit green light, as this is deemed by ornithology experts to have less effect on migratory birds' navigation systems (see Chapter 12).
- Portable lighting units will be positioned in such a way as to minimise glare and potential to impact on the local community and ecology of the area (see Chapter 12).

11.6.5.5 Waste Management

- A project specific Waste Management Plan will form part of the EMP for construction. The Waste Management Plan will encourage waste minimisation, segregation, reuse and recycling principles to be adopted on the project where possible.
- The Waste Management Plan will reflect the preferred options for managing materials generated during construction as outlined in the Materials Management Plan (see Appendix S4).
- A Hazardous Substance Management section will be included in the Waste Management Plan.
- A policy of recycling and reuse will be encouraged throughout construction, particularly in the case of material arisings from the tunnelling process and construction of the LVI and the use of drilling fluid for the tunnelling process.
- If materials cannot be reused during construction they will be exported off site for reuse or recovery, where possible.

11.6.5.6 Raw Materials

- Raw materials will be sourced locally where possible.
- Raw materials will be managed in accordance with the EMP for construction.
- Procurement management systems will be implemented to prevent over or under-supply of materials required for the construction of the onshore pipeline.

- The sustainable use of natural resources will be encouraged throughout the construction process.
- Consideration will be given to the use of existing temporary facilities in the Terminal site, where possible.

11.6.5.7 Sustainable Construction

Consideration will be given to the sustainable sourcing of all materials. As the proposed development is located in a rural part of North West County Mayo, materials such as diesel will be sourced from local suppliers. The reuse of materials arising from the tunnelling process on the Corrib Onshore Pipeline project offers sustainability advantages over sourcing road / bedding materials from quarries. By reusing suitable materials where possible, there will be less construction traffic and less demand on local quarries. Any surplus materials arising from the tunnelling process and materials arising during demobilisation and the reinstatement process (mainly stone) has potential for reuse in other construction projects. Further details are provided in Appendix S4.

Bentonite used for the tunnelling process will be recycled within a closed system during the tunnelling process thereby minimising the quantity used.

Fresh water is required for the tunnelling process. It is proposed to collect rainwater at the tunnelling compounds to reduce the quantity of water that will be transported to the site by road tanker. Likewise, the drilling fluid will be recycled as much as possible to reduce the requirement of fresh water during tunnelling operations.

Energy management systems will be put in place, as well as general good office and site compound practises, to ensure the efficient use of lighting, electricity, ventilation, etc.

11.6.6 Residual Impact

It is anticipated that that there will be no significant residual impact on natural and other resources.