- **Bentonite Silos** – 2 no. silos, volume (approximately 25m^3) each used for storage of bentonite (in powder form).

- **Storage area for tunnel arisings** – Located adjacent to the bentonite handling plant. This area will be designated for the storage of tunnel arisings following the treatment process. Approximately 2,250m^2 has currently been allocated for the storage of tunnel arisings within the Aghoos Tunnelling Compound itself. A further 4,800m^2 has been allocated at the adjacent stringing area. These two areas combined will be capable of storing over 100 days of arisings at a tunnelling progress rate of 11m per day (estimated to be the average progression rate for the tunnel).

- **Lighting** – The Tunnelling Compound and Stringing Area will be provided with artificial lighting for carrying out operations at night. The lighting system will consist of lanterns mounted on 8m high poles located to provide an adequate standard of lighting to facilitate the necessary construction operations both safely and effectively. The lighting system will be designed to minimise spill of lighting outside of the compound.

- **Workshop** – General storage, testing and workshop.

- **Offices and welfare facilities** – Required for staff working at the site.

Given the site's proximity to Sruwaddacon Bay (Glenamoy Bog Complex cSAC / Blacksod Broadhaven pSPA), the compound incorporates features to mitigate potential impacts on the cSAC / pSPA (see Section 5.15).

It is estimated that the Aghoos Tunnelling Compound (SC3) will be in place for approximately 26 months. Figure 5.7 shows a typical arrangement of the tunnelling compound and stringing area (see below).

5.5.2.1 Aghoos Stringing Area

A pipeline stringing area (the 'Aghoos Stringing Area') will be constructed adjacent to the Aghoos Tunnelling Compound. This compound will be used for welding sections of pipe together and preparing associated services for installation within the completed tunnel. This site will consist of:

- Temporary storage areas for sections of gas pipeline, water discharge pipeline, umbilicals, etc;

- Pipe supports and rollers, which will be used to move assembled pipe sections into the tunnel;

- Ancillary equipment including cranes / side-booms with which to lift and move sections of pipe; and

- Mobile welding equipment and other plant required to assemble the pipeline sections.

Once the tunnel has been successfully constructed, the umbilicals and other services will be installed. These will be mounted on the inside wall of the tunnel, allowing space for the installation of the gas pipeline, water discharge pipeline and spare HDPE duct. The tunnel railway system will be used for this installation process.

The onshore pipeline will be welded together in the stringing area in sections approximately 80m long. These sections will be mounted on rollers for insertion into the tunnel. Sections of the water discharge pipeline and a spare HDPE duct (identical to the water discharge pipeline) will also be assembled in lengths of 80m and bundled (one each side) with the onshore pipeline. Each 80m bundle will be mounted on trolleys and transported inside the tunnel using the tunnel railway system.

It is estimated that the Aghoos Stringing Area will be in place for approximately 21 months.

5.5.2.2 Glengad Reception Pit and Compound

The reception pit at Gleann an Ghad (Glengad) (the 'Glengad Reception Pit') will be located within a compound (SC2) approximately 65m x 55m in size. Part of this compound will be located within the boundaries of the Glenamoy Bog Complex (cSAC).

The reception pit will consist of a sheet-piled excavation approximately 8m deep x 7.5m wide x 15m long. The pit will have a concrete base anchored with soil anchors. A sealing body, located next to the reception pit (to the east) will consist of a second sheet-piled excavation similar in size to the reception pit, which will be backfilled with a low strength mortar.

As tunnelling nears completion, the TBM will pass through the sealing body to emerge at the reception pit where it will be dismantled and removed over a period of approximately one month. Due to the large size of the TBM, a crane will be required at this site.

It is estimated that the Glengad Reception Pit will be in place for approximately 12 months.

5.5.3 Construction of Aghoos Tunnelling Compound, Aghoos Stringing Area and Glengad Reception Pit and Compound

The following sections describe how each of the compounds associated with the tunnelling process will be established and constructed, as listed below.

- Aghoos Tunnelling Compound - Site Set Up;
- Aghoos Tunnelling Compound – Construction;
- Aghoos Stringing Area – Site set-up & Construction; and
- Glengad Reception Pit and Compound – Construction.

5.5.3.1 Aghoos Tunnelling Compound - Site Set Up

The tunnelling operation will be carried out from the tunnelling compound located in peatland in Na hEachú (Aghoos).

Temporary access roads to facilitate the installation of the fencing will be constructed using bogmats. Approximately 2,500m of 3m high steel palisade fencing will be erected around the perimeter of the site. The fencing will be fastened to bogmats for support and stability.

Once the site is established, construction of the surface water management system will take place. Access will be provided by bogmat roads. The surface water treatment system will comprise a bypass separator for removal of hydrocarbons followed by a settlement lagoon for removal of suspended solids and the installation of a filtration system for removal of finer particles. The surface water treatment system will be located at a low elevation on the site to enable surface water run off to gravitate towards it, thereby avoiding the requirement for pumping during the works. The overflow outfall from this system will be to an existing surface water ditch that flows into Sruwaddacon Bay. Connecting pipe work will be installed for future tie-ins to the compound drainage network.

The development and construction of the tunnelling compound will require the temporary storage of peat for use in the reinstatement of the site following completion of tunnelling operations. It is proposed to provide peat storage areas south of the tunnelling compound between the compound and the public road. These areas will be serviced by bogmat access roads. V-ditches will be installed both up slope and down slope of these areas to intercept and collect surface water run-off and direct it to the surface water treatment system. Culverts will be placed at locations where access roads must cross existing drains and ditches.

5.5.3.2 Aghoos Tunnelling Compound - Construction

Following completion of the works described above, construction of the tunnelling compound will commence. This will be a bulk earthworks operation involving the importation of quarry stone and the removal of peat to the Srahmore Peat Deposition Site.

The works will begin with the construction of the main stone access road to the site. This 6m wide access road as well as the main compound will be constructed in a similar manner to the stone road construction method described in Section 5.4.5. The surface layer of peat including vegetation will be removed and stored at the designated peat storage area on site for use in future reinstatement activities. Below this layer, peat to a depth of up to 1.0m above mineral soil will be excavated and removed off site to the peat deposition site at An Srath Mór (Srahmore).

Stone will be delivered in tipper lorries from local quarries and placed over the excavated peat surface. The stone will displace peat and will also be pushed into the remaining layer of peat using excavators (see Appendix M2). The access road will be constructed progressively in this way, with machinery always working from on top of the stone structure.

Peat plugs will be installed at suitable intervals to prevent the longitudinal flow of water within the road. The surface of the road will be finished with capping material. This will consist of small well graded quarry stone that can be compacted to provide an even surface for trafficking. V-ditches constructed alongside the access road will be used to collect surface water run off and direct it towards the treatment system via gravity flow.

It is intended to construct the access road as far as the settlement lagoon, a distance of approximately 400m from the public road. In order to avoid the requirement for tipper lorries to drive long distances into the area of peat, a peat handling area will be constructed at the location where the access road meets the compound. This area is approximately 2,500m^2 in size and will be used to transfer the excavated peat from site dumpers to road-going tipper lorries. A wheelwash system will be set up in this area and trucks leaving the site will be cleaned before they exit onto the public road.

The tunnelling compound covers an area of approximately 24,000m^2. It will be built in the same manner as the access road, with construction beginning at the lower end of the site in order to facilitate the connecting of the initial drainage network, and progressing up hill. The drainage system will be installed as the construction of the compound progresses.

A starting pit and ramp will be excavated for the tunnelling operation. These works will commence once sufficient working space has been provided within the compound area. The starting pit will be approximately 8m long x 10m wide x 12m deep. The ramp for accessing the pit will be approximately 75m long x 5m wide and increase in depth from 0m to 10m below ground level. Construction of the starting pit and ramp will entail the installation of sheet piles (and bracing where necessary), excavation of stone, installation of soil anchors and the placement of reinforced concrete.

A 3m high non-transparent noise barrier (fence) will be installed around the perimeter of the compound and inside the palisade fencing, following completion of the stone placement works. This barrier will be designed to mitigate the potential noise emissions from the works in the compound. It will also serve to visually screen the works.

The surface of the tunnelling compound will be finished with 100mm – 150mm of surface dressing (tarmacadam). The surface dressing will provide a clean impermeable surface facilitating rainwater harvesting and contributing to general site tidiness.

5.5.3.3 Aghoos Stringing Area - Site Set Up and Construction

Once tunnelling operations are underway the stringing area will be constructed. The stringing area will only be required during the assembly and installation of the onshore pipeline and associated services within the tunnel.

The stringing area will be constructed in the same manner as the tunnelling compound; however, it is proposed to combine tunnel arisings with quarry stone to complete the construction of this area. It is

estimated that approximately 11,000m^3, or half of the fill used for this compound, will be tunnel arisings. The surface of the stringing area will be finished with 100mm – 150mm of surface dressing (tarmacadam).

V-ditches and linear drainage channels will be installed and connected to the surface water treatment system at the compound where ground levels permit. Where required, water pumps will be used to address height differences in the terrain. The drainage system is designed for a 1 in 20 year rainfall event. Where ground levels are unsuitable, a second surface water treatment system, similar to the system at the compound will be constructed. The overflow outfall from this system will be to an existing surface water ditch that flows into Sruwaddacon Bay.

A stone road access from the public road will be constructed at the eastern end of the stringing area and a one way system will be adopted on the site.

A 3m high non-transparent noise barrier will be installed around the perimeter of the stringing area following completion of the stone placement works (see above).

A temporary stockpiling area for tunnel arisings will be provided in the eastern end of the stringing area, as described above.

5.5.3.4 Glengad Reception Pit and Compound - Construction

Before the completion of the tunnel a reception pit will be constructed in Gleann an Ghad (Glengad). A temporary access road and site compound will be required. These will be constructed using material recovered from the excavation of the LVI dished area, and they will be surfaced with stone capping material from a local quarry.

Topsoil will be stripped from the area of the compound and stockpiled for use during reinstatement. Sheet piles for the reception pit will then be installed over a period of approximately two weeks. Once these have been installed, the pit will be excavated. Materials excavated will be stockpiled locally, separately from topsoil.

The base of the reception pit will be lined with concrete to provide a level surface and to seal the pit. Approximately half of the reception pit will be filled with low strength mortar. This part of the reception pit is referred to as the sealing body. The purpose of the sealing body is to seal the annular space at the end of the tunnel.

5.5.4 Reinstatement of Na hEachú (Aghoos) and Gleann an Ghad (Glengad) Compounds

5.5.4.1 Aghoos Tunnelling Compound and Stringing Area

On completion of the installation of the onshore pipeline, umbilicals and services, reinstatement of the compound and stringing area at Na hEachú (Aghoos) can commence. Equipment and machinery will be disconnected and disassembled and removed from the site. Tanks will be emptied in a controlled manner and removed, bund walls will be demolished and offices and welfare facilities will be removed. Ducting and pipework will be decommissioned and removed. Once the onshore pipeline and associated services have been installed in the tunnel and the tunnel fully grouted, the starting pit and ramp will be back filled with tunnel arisings stored at the temporary stockpiling area and the sheet piles will be cut to a depth of 1m below finished ground level.

Once the site has been cleared, the operation to remove the surface dressing from the compound and the stringing area can begin. A road planer will excavate and gather the tarmacadam, which will be removed off site to an authorised facility. This material can be recycled. The site drainage system will be maintained throughout the period of surface dressing removal.

Once the surface dressing has been removed, the noise barrier fencing will be taken down and removed from site. Following removal of this fence, the top 300 – 600mm of stone will be removed from the tunnelling compound and stringing area.

The placement of up to 600mm of peat over the surface of the tunnelling compound will then be sequenced to maximise the availability of the drainage network before it too is eventually removed.

The access road will be maintained to the surface water settlement lagoon area(s) up until the end of the reinstatement works. At this stage the surface water treatment system will no longer be required. The bypass separator, filtration unit and settlement lagoon will be removed and the ground will be reinstated and surface water drains and ditches will be restored throughout the site.

Following the completion of the peat reinstatement works the bogmats in the peat storage areas will be removed along with any culverts that were installed. V-ditches will be filled in and surface water drains and ditches will be restored throughout the site. Finally the perimeter fencing will be taken down and the bogmats removed.

5.5.4.2 Glengad Reception Pit and Compound

Once the TBM has been removed from the site and onshore pipeline and associated services have been installed, the site of the reception pit can be reinstated. This will involve cutting the sheetpiles to a depth of 1m below finished ground level and backfilling the pit with stockpiled subsoil. The compound will be removed and stockpiled subsoil will be placed. Topsoil stripped from the area and stockpiled nearby will be used to complete reinstatement of the area. This will be graded and levelled. The area will be allowed to revegetate naturally.

5.6 CONSTRUCTION OF LANDFALL VALVE INSTALLATION

The area of the Landfall Valve Installation (LVI) will be set out and fenced off prior to construction. A separate compound (SC1) will also be established from which construction activities in this area will be based. The compound will be constructed in a similar manner to the Glengad Reception Pit and compound.

Access to the LVI will be via the access road from local road L1202.

The first stage of the construction of the LVI will be to excavate the site to the required levels. Topsoil will be stored separately to preserve the local seed bank and facilitate reinstatement. After removal of the topsoil and overburden layers, some excavation, in the rock layers will be required.

After completion of the excavation, various civil works will be undertaken. These include the construction of foundations, fencing and the surface water drainage system.

Most of the LVI pipework and associated equipment will be fabricated in sections off site. These sections will be brought to the site and assembled in situ and then connected with the onshore and offshore pipeline, as appropriate.

Upon completion of the construction works, the area surrounding the LVI will be reinstated using temporarily stored topsoil. Within the LVI site, a geosynthetic mat (e.g. 'geo-jute') will be used on the slopes surrounding the LVI to stabilise topsoil against erosion.

5.6.1 LVI Surface Water Outfall

Surface water collected in the LVI dished area will pass through a separator prior to discharging onto the foreshore via the surface water outfall pipe. In order to install the surface water outfall pipe a section of the foreshore will be fenced off. Construction will require the excavation of a trench of up to 5.5m depth in places and up to 15m wide from the LVI through the cliff face. A geotextile separation layer will be placed at the base of the cliff face, on top of which a headwall will be constructed using gabion mattresses and baskets. These will be hand filled with locally sourced stone in order to ensure that the headwall will not be visible when the construction is completed. The outfall pipe will terminate at the headwall. The area in front of the headwall will be reinstated with locally sourced stone that will be hand picked, such that the outfall will not be visually obtrusive and will blend into the local

surroundings. The proposed approach to construction of the surface water outfall will be subject to further optimisation to reduce potential impacts where possible.

5.7 TEMPORARY WORKS

5.7.1 Site Compounds

In addition to the tunnelling compounds already described (SC2 and SC3) and the LVI construction compound (SC1), two other site compounds will be located along the pipeline route. These compounds will be located as follows:

- SC4:In the vicinity of where the proposed pipeline route crosses the L1202 (RDX 1); and
- SC5: Within the Gas Terminal site;

These compounds will normally contain site offices/cabins, welfare facilities, vehicle parking and material storage and stockpiling areas. The proposed locations of these site compounds are shown in Figure 5.2. All stockpiling will be contained within the site compounds and temporary working areas. Hard standing will be used, where necessary, and the area will be secured by fencing for safety. Where pipe stringing will take place adjoining the pipeline, an additional working area will be required as shown on Figure 5.2. In some of these locations preparatory geotechnical works may be required.

5.7.2 Energy Requirements

Most construction plant and machinery will be powered by diesel engines, including plant and equipment associated with the tunnelling works. Many items of plant will need to be refuelled on the temporary working areas from mobile diesel bowsers. Diesel fuel will be stored and handled carefully to ensure that spillage is avoided. The storage and handling of diesel will be managed through procedures to be established in the Environmental Management Plan (EMP).

Electrical requirements for construction, e.g. for site lighting, etc, will be met either with diesel powered generators or by local temporary electricity connections procured through ESB Networks. Heating requirements, e.g. for site cabins will be met by electrical heaters powered by diesel generators.

Diesel generators will be enclosed in sound proofed containers to minimise the potential for noise impacts.

Construction energy requirements are covered in detail in Chapter 11.

5.7.3 Lighting

Lighting of temporary working areas and tunnelling and site compounds during periods of darkness will be minimised to that necessary for security and safety reasons. The tunnelling operations will require continuous working (on a 24 hour basis, 7 days per week) and therefore night-time lighting will be a feature of the Aghoos Tunnelling Compound. The lighting will be designed to minimise local disturbance and glare; only essential lighting will be used. Local residents will be notified in advance. The Aghoos Tunnelling Compound will be enclosed by 3m high, non-transparent noise barriers that will largely contain the light within the compound perimeter.

In general, lighting (where required and including lighting that may be required for security staff) will be powered by generators in a central location on each work area.

5.8 TESTING AND COMMISSIONING

Testing of the Onshore Gas Pipeline and LVI is an integral part of the commissioning activities.

Testing of the water outfall pipeline and services will also be carried out in accordance with SEPIL and relevant industry standards.

All test methodologies and acceptance criteria will be specified prior to the carrying out of any test. Strict safety precautions will be imposed during all testing and only suitably qualified and experienced personnel will be involved. All test results and test parameters will be documented. Where test results fall outside the agreed acceptance criteria, repair work or modifications will be carried out. Subsequently, the appropriate acceptance test will be repeated.

The equipment in the LVI will be tested in accordance with the required standard and the manufacturer's recommendations. This will include full function testing of the valves and the control system.

Further details on testing the integrity of the onshore pipeline and services are contained in Chapter 4.

5.8.1 Testing of all Materials Prior to Construction

SEPIL will carry out quality assurance inspection during manufacturing and prior to and following shipping of all materials to the site. Any materials that fail the quality inspection will be marked and isolated to ensure that they are not used as part of the project.

5.8.2 Testing of Welds

All welds will be tested in accordance with strict industry standards using visual inspection and non-destructive inspection techniques.

5.8.3 External Testing

The external pipe coating will be inspected for defects during the installation procedure. This will include all joints where field coating is applied over welds. A holiday test will be carried out prior to ditching operations. Any flaws or defects discovered will be repaired immediately and re-inspected upon completion.

The excavated trench will also be inspected for correct depth, width and proximity to utilities, where relevant. Ditching operations and installation of services within the tunnel will be monitored to ensure that the onshore pipeline, water outfall pipeline and services are installed correctly and not damaged in the process.

5.8.4 Hydrostatic Pressure Testing

Once all sections of the onshore pipeline have been installed, ditched, tied-in and backfilled, the pipeline will be filled with water for a hydrostatic pressure test. This operation proves the assembled pipeline's pressure integrity and is a requirement of the relevant design codes. Testing involves pressurising the water in the pipeline for a set period of time using an approved test pressure.

The water to be used for the hydrostatic pressure testing will be sourced from the Gas Terminal and also from the rainwater storage tanks at the tunnelling compound at na hEachú (Aghoos). It is proposed that hydrostatic test water be disposed of at sea via the water outfall pipeline, which terminates in a diffuser on the sea bed approximately 2km north of Erris Head.

The total quantity of water to be disposed of from the hydrostatic testing of the onshore pipeline is approximately 2,500m^3. This water will be treated at the Gas Terminal and will not contain any additives or chemicals. It will be sampled and analysed for a range of parameters prior to disposal to ensure that it does not contaminate the receiving environment.

5.8.5 Pre-Commissioning of Onshore Pipeline

After the hydrostatic testing is complete, the pipeline will be inspected internally by pigging. A temporary pig receiver will be installed at the LVI for this purpose. Several types of pigs will be used to test the pipeline, including the following:

- A gauging pig is made up of a soft metal (e.g. aluminium) ring that is slightly smaller than the internal diameter of the pipeline. It will test for any internal obstructions in the pipeline. The soft metal ring will be damaged if the internal diameter of the pipeline is, for some reason (e.g. a dent), smaller than what is permitted by the pipeline design specification.

- Water filling / dewatering pigs will be used to fill the pipeline with water for hydrostatic testing and to dewater the pipeline after hydrostatic testing. These pigs fit snugly inside the pipeline.and can be made of foam or metal with rubber gaskets.

- An intelligent pig is used to measure the pipeline wall thickness, relating this to location. Intelligent pigs use electronic measurements to obtain the required data. Intelligent pigs will be run during pipeline pre-commissioning and during operations as part of the pipeline integrity monitoring regime.

After the pigging operations and inspections have been completed, the temporary pig traps will be removed. The pipeline will then be tied in to the LVI by welding.

It may also be necessary to use temporary pumps and tanks at Gleann an Ghad (Glengad) and at the terminal site for a short period during the pre-commissioning /commissioning phase for the pipeline. Nitrogen generating equipment at the terminal site may also be required.

Once the pipeline is fully tied in, the onshore pipeline will be purged of air using nitrogen gas from the Offshore Pipeline. It will then be ready for gas commissioning.

5.8.6 Commissioning

Commissioning involves the introduction of natural gas into the pipeline and the testing of all safety and emergency systems associated with the overall system. The first stage in the process will be to purge nitrogen gas from the entire pipeline (offshore and onshore). Gas from the Corrib Field will be introduced to the pipeline system by opening gas wells one at a time. Nitrogen gas in the pipeline will be vented at the Gas Terminal. When the composition of the gas reaching the Terminal is of sufficient quality (composition of nitrogen is below required specification), the Terminal will be ready to export gas to the gas transmission network.

5.9 CONSTRUCTION TRAFFIC AND ACCESS

The mobilisation and demobilisation of construction plant and the delivery of materials along with vehicular movements from construction personnel will generate the majority of traffic associated with the proposed development. Where possible, the temporary working area will be used for transportation of plant and equipment thus minimising movement on public roads. As pipeline construction proceeds, associated traffic will move in tandem with construction activities along the temporary working area.

Plant and equipment will normally be contained within the temporary working area, site compounds or at the Terminal site.

In certain locations, temporary access roads will be required to allow the movement of construction traffic between the public road and the temporary working area. The locations of proposed temporary access roads are shown on Figure 5.2.

At points where construction related vehicles travel from the works area onto the public road network these will be inspected and cleaned as necessary. Wastewater from cleaning will be recovered and

discharged at locations agreed with Mayo County Council. Where the intensity of the construction traffic demands it, wheel washes may be used. The public road network in the vicinity of the works will be inspected daily and will be cleaned, using road sweepers, as required

Residents in the vicinity of the works will be made aware of construction activities. Special arrangements may be required to ensure that residents have necessary access to their properties at all times. The Traffic Management Plan (Appendix E) will be agreed with Mayo County Council and will be updated from time to time, as required, in consultation with the relevant authorities.

Generally, the construction of temporary access roads will involve the excavation of topsoil and the application of crushed stone or wooden bog mats and a geotextile membrane. All temporary access roads will be removed once construction is complete and the land will be reinstated.

5.10 WORKFORCE

It is estimated that some 120 to 140 workers will be employed during the construction of the Corrib Onshore Pipeline. These will include construction operatives and construction management personnel. Where possible, staff resources and services will be sourced locally, however, specialist pipeline workers will be required in particular for welding and for the tunnel construction under Sruwaddacon Bay.

5.10.1 Working Hours

Normal working hours for the non tunnelling activities are proposed to be between 07:00hrs and 19:00hrs, Monday to Friday, and between 08:00hrs and 16:00hrs on Saturdays. Tunnelling at Na hEachú (Aghoos) and certain inspection and commissioning activities will need to be undertaken on a continuous (24 hour, 7 days per week) basis.

Apart from tunnelling operations, Sunday working will be avoided, where possible, but cannot be entirely excluded. If extended working hours are required, these will be discussed in advance with local residents and with Mayo County Council.

Road haulage activities will generally be restricted to between 07:00hrs and 19:00hrs Monday to Friday and between 07:00hrs and 16:00hrs on Saturdays as set out in the Traffic Management plan (Appendix E).

Night-time security will be present at the temporary compounds and working areas.

5.11 CONSTRUCTION PLANT AND EQUIPMENT

The typical plant and equipment required for construction of the Corrib Onshore Pipeline are listed in Table 5.1.

Table 5.1: Typical Plant proposed for general construction activities.

Description	Purpose	Notes	Number Required (approximate)
Dozer	Topsoil stripping and reinstatement in areas of improved agricultural land.	Tracked. Diesel engine powered.	5
Excavator	Excavating trench. Management of materials. May also be employed for breaking fractured rock for excavation. General purposes.	General purpose machines. Small and large machines will be used. Diesel engine powered.	5 Large 5 Small
Side Boom	Lifting and 'ditching' assembled pipeline into trench.	Heavy Plant (up to 70 tonnes in weight). Tracked. Diesel engine powered.	5
Mobile Welding Unit	Provide mobile power and equipment for welding of pipeline.	Wheeled or tracked. Relatively light equipment (<15 tonnes). Diesel engine powered.	10
Crawler Crane	Lifting plant and equipment into position.	Heavy Plant. Tracked. Diesel engine powered. Likely to be used at LVI, Aghoos Tunnelling Compound and Glengad Reception Pit.	4
Dumpers	Transport of stone / excavated peat at site works. Generally used within compound areas and along the pipeline spread, but may be used on public road for short distances.	Typically wheeled (6 wheel drive) on low ground pressure wheels. Capacity 25 – 40 tonnes. Diesel engine powered.	10
Tracked Loader or Pipe Carrier	Transport of pipe lengths to the pipeline spread.	Tracked. Diesel engine powered.	5 - 10
Generator	Provide electricity in remote locations.	Stationary (or mounted on mobile plant). Diesel engine powered.	10 - 15
Piling Rig	Installing piles.	Tracked. Diesel engine powered.	1 - 4
Tunnel Boring Machine (TBM) and associated power packs.	Tunnelling. Power packs provide power for: • TBM • Pumping of cuttings from tunnel face • Air handling and lighting within tunnel	Power packs are Diesel engine powered (remotely) and contained within acoustic enclosures.	1
Bentonite Handling Plant	Separates tunnelling arisings from bentonite slurry.	Stationary plant. Electric / Diesel engine powered.	1
Road Going Trucks (HGVs)	Movement of construction materials, cabins, plant and water	Road going tipper trucks (articulated or rigid) Capacity 20 – 30 tonnes. Diesel engine powered.	10 - 20

Other plant and machinery used during construction include tractors and trailers, trucks, rock breakers (provisional) mounted on excavators, site vehicles (4x4), pumps and road dressing equipment.

5.12 CONSTRUCTION MATERIALS

The construction process will require efficient management of materials. The main materials that will require management throughout the construction of the onshore pipeline are listed in Table 5.2

Table 5.2: Construction Materials

Item	Description
Line Pipe	Pipe lengths will be transported to a temporary storage location or they will be delivered direct to the works, as required, using suitable transportation (HGVs on road sections and off-road vehicles along the temporary working area). Any 'off cuts' will be returned to the Gas Terminal site for appropriate disposal or re-use.
Auxiliary Services	Sections of the water outfall pipeline and services will initially be stored at the Gas Terminal. These will be transported to the temporary working area and assembled there.
Stone (and other granular fill)	In many locations stone is used for the provision of a stable, all weather access to the works and for long sections of the temporary working area. Locally sourced stone will be used for these purposes. In the case of the construction of the stringing area, pipeline trench, and the stone road, tunnel arisings combined with locally sourced quarry stone will be used where appropriate. Stone used for construction may be left in situ or removed depending on local requirements. For example, stone roads are proposed to be left in-situ in areas of peatland.
Peat	Peat excavated during construction will either be used for reinstatement or disposed of off site or both. Surplus peat will be transported to the An Srath Mór (Srahmore) peat deposition site.
Concrete	Ready-mix concrete will be used at the LVI, for construction of the tunnelling start and reception pits for the tunnel, and for the foundations of tanks and heavy equipment at the tunnelling compound. Pre-cast concrete slabs may be used at certain locations, e.g. road crossings.
Bentonite	Bentonite used for the tunnelling will be imported and mixed to the required consistency on site. Bentonite will be recycled and reused, where possible, throughout the operation and surplus quantities will be removed upon completion. Bentonite requiring disposal will be sent to a licensed disposal facility.
Engineered Materials	Engineered materials (including bog mats, geotextiles, geogrids, steel sheet piles and other piling systems) will be used.
Water	Water required by the construction process will either be harvested from rainfall, sourced locally, brought in in tankers or sourced from the Terminal site or a combination of these. Water will be required for a number of purposes including tunnelling, cleaning plant and machinery and for hydrostatic testing of the onshore pipeline. The sourcing of additional water to be used for hydrostatic testing (if required) and disposal points for hydrostatic test water will be agreed with the relevant authorities.

Sustainable management principles will be used in the management of all materials proposed for the construction of the project in accordance with the EMP which will be drawn up for the works (see Section 5.14.2).

5.13 PROJECT MANAGEMENT

5.13.1 Construction Management

SEPIL will oversee the construction activities to make sure all the commitments given during the planning stages are implemented throughout the execution of the project. The proposed project management structure for the construction phase is outlined as follows:

- Construction Manager on site, who will oversee the entire project and who will ensure that the works are undertaken in accordance with the Contract Documents, the measures outlined in this EIS, the Environmental Management Plan (EMP) and detailed Method Statements agreed with the relevant authorities. The Construction Manager will also have responsibility for the Health and Safety Plan.
- Senior Pipeline Engineers who will take field responsibility for construction activities.
- Geotechnical Engineer who will monitor and supervise civil works in peatland areas.
- Field Surveyors who will survey and prepare 'as laid records'.
- Transport Manager who will manage transport activities.
- A Community Liaison Officer, who will communicate with the local community and landowners during the works (see Chapter 2).
- A Landowner Liaison Officer, who will communicate with landowners on agricultural issues as they arise during the construction phase.
- An Environmental Officer, who will supervise the works from an environmental perspective, ensuring compliance with commitments made in the EIS and the EMP (see Section 5.13.2). The Environmental Officer will have the power to stop any works not following agreed method statements and EIS commitments. The Environmental Officer will also ensure that all construction personnel receive appropriate induction training on environmental issues, including pollution awareness and control associated with the project prior to commencing work. The Environmental Officer will coordinate and be the site focal point for communication with the relevant statutory bodies, e.g. NPWS and NWRFB.
- Environmental Specialists who will supervise and advise on all relevant ecological and archaeological features.
- Specialist Inspectors reporting to the Construction Manager and who will supervise the construction according to design and engineering aspects of the project.
- Safety Officer.
- Contract Administration Staff.

5.13.2 Environmental Management Plan (EMP)

Preventative and management measures will be applied throughout the construction phase to ensure that all environmental effects associated with the proposed development are minimised, mitigated or avoided as outlined in Chapter 18. Various tools will be implemented to ensure sound environmental management. These include the preparation of an EMP.

The EMP will be used as an management tool to ensure compliance with all relevant environmental regulations and standards and to minimise the potential impacts associated with the development. This EIS will form the basis for many of the environmental procedures that will be fully developed within the EMP.

The EMP will be drawn up in accordance with the schedule of commitments presented in Chapter 18 of this EIS. It will detail measures to minimise actual and potential impacts associated with the construction phase, describing or referencing the procedures and equipment proposed to prevent, monitor and manage possible effects. The EMP will serve as a compliance document recording the progress of commitments and their conformity with the requirements set by the relevant authorities and the expectations of the public.

Typically the EMP will address topics as shown below.

- Vegetation clearing
- Audits and review
- Environmental Liaison and Consultation
- Pollution Control
- Waste Management
- Traffic Management
- Hazardous Substance management
- Environmental Supervision & Training (all personnel)
- Environmental Health and Safety (EHS) performance
- Spill Contingency
- Dust Management
- Noise Management
- Reinstatement Management/Monitoring
- Disease Prevention
- Community Liaison
- Surface Water Management
- Landowner Liaison

Construction method statements will be developed to manage the construction activities in accordance with the EMP and EIS committments. The EMP will also establish monitoring protocols for ecology, archaeology, water, dust, noise and sediment control. The monitoring programmes will be outlined in detail within the EMP and will include the timing and frequency of monitoring and policies for evaluating and amending the monitoring programme.

Once detailed design information is available, the EMP will be finalised. Upon the commencement of construction, the EMP will be reviewed according to a regular timeframe and updated, if necessary. These updates will be made in consultation with relevant regulatory authorities.

The EMP will provide systems for the effective environmental management of the construction process covering important items such as waste management and pollution control. Environmental auditing will be carried out to ensure compliance with the EMP.

Environmental liaison and consultation with statutory bodies, local authorities and non-statutory organisations, where required, will continue throughout the construction of the onshore pipeline system.

SEPIL is committed to achieving a level of environmental management and performance consistent with national and international standards and in compliance with all relevant statutory obligations. It will seek to incorporate the most environmentally sound technology and procedures into the design of the project in order to ensure optimal management of all activities. These environmental commitments are summarised in Chapter 18.

5.13.3 Construction Health & Safety Plan

A Risk Assessment for the construction phase of the Corrib Onshore Pipeline will be developed by SEPIL. This Risk Assessment will form the basis for the Preliminary Health & Safety Plan required under the Health, Safety and Welfare at Work (Construction) Regulations 2006. The Preliminary Health & Safety Plan will be produced by the appointed Project Supervisor Design Process (PSDP).

The Preliminary Health & Safety Plan will in turn be further developed by the appointed Project Supervisor for the Construction Stage (PSCS) to produce the Health & Safety Plan for the construction phase of the project. The Plan will help to ensure that construction risks are minimised, and will include the following typical requirements:

- Responsibilities and organisation;
- Relevant drawings and specifications;
- Information on relevant adjoining land uses;
- Site constraints;
- Known existing services;

- Safety and health hazards and associated risk assessment;
- Risk reduction measures;
- Emergency procedures; and
- Communication and liaison requirements.

The appointed Project Supervisor for the Construction Stage (PSCS) will coordinate with the Project Supervisor Design Process (PSDP) for all design work during construction.

The selection of competent contractors who will apply safety management systems under the supervision of a strong project construction management team will minimise risks to an acceptable level.

5.14 ENVIRONMENTAL CONSIDERATIONS

Table 5.3 outlines the key environmental constraints along the route of the proposed pipeline and describes the mitigation measures proposed to avoid and or minimise the environmental impact of the proposed construction activities.

During the mobilisation of the project all staff will receive inductions and training relevant to their role during construction. This will include training on environmental aspects outlined in the EMP and will indicate sensitive areas, environmental precautions and good environmental practice on site.

The design of the tunnelling compound in na hEachú (Aghoos) incorporates environmental mitigation such as:

- Fencing to attenuate construction noise and reduce lighting and visual impact;
- Reuse of excavated materials where possible;
- Rainwater harvesting on site and reuse of water and drilling fluid where possible;
- A detailed surface water drainage system including specialist treatment facilities;
- A lighting system designed to minimise visual impact;
- Application of surface dressing to the compound which will provide a clean impermeable surface contributing to rainwater harvesting and general site tidiness;
- Set up of a wheelwash system in this area, allowing trucks leaving the site to be cleaned before they exit onto the public road; and
- Use of sound proofing on plant, such as generators and pumps, to reduce the levels of noise generated on site.

Care will also be exercised at all watercourse crossings traversed by the onshore pipeline. Watercourse crossings will be carried out in isolation of stream flow in order to avoid disturbance and to prevent water escaping onto the temporary working area. Construction methods at watercourses will be discussed with NPWS and NWRFB prior to commencement of construction, and liaison with these agencies will continue throughout the construction period.

Particular restrictions associated with issues such as disturbance of bankside vegetation and operation of plant and machinery will be required at watercourse crossings.

An EMP will be developed to ensure that construction of the onshore pipeline is carried out in accordance with the EIS commitments, all relevant legislation, regulations and standards and in line with current environmental best practice. Furthermore, the construction of the onshore pipeline will be supervised and closely monitored by an Environmental Officer to ensure that construction is carried out in compliance with the EMP. Specialists such as the Project Archaeologist and the Project Ecologist will also monitor and supervise the works.

Table 5.3: Key Environmental Constraints and Mitigation.

Environmental Constraint	Mitigation
Sruwaddacon Bay is an important habitat for birds and wildlife and is designated as a cSAC and pSPA. Sruwaddacon Bay is also a Ramsar site.	Tunnelling – The proposed construction method for installation of the pipeline through Sruwaddacon Bay is via segment lined tunnelling. Trenchless methods provide a means of pipeline installation that cause minimal disturbance to the surface of the area traversed. In this way, the construction of the proposed Corrib Onshore Pipeline in Sruwaddacon Bay can be carried out with minimal impact on the estuary. The tunnelling compounds located onshore will be subject to noise attenuation and appropriate lighting design to minimise the impact of the construction activities on local residents and wildlife.
The onshore pipeline route passes through an area of sensitive peatland in a non-designated area. It also passes through salt marsh.	'Stone Road' Method – The preferred construction method that will be used in areas of peatland will be the 'Stone Road' method. This method will provide a stable platform on which construction plant and machinery can operate and provide added stability and support to the installed pipeline. The same approach will be used to build the tunnelling compound at na hEachú (Aghoos). Conservation of vegetated layer of peat – Turving will be carried out in one location (approximately 190m long) to the east of the Leenamore River. In this area, the width of the stone road will be 9m to minimise impact. This approach will preserve the active surface layer of peatland in this area and assist the reinstatement of the area affected by construction. In other areas of peatland where it is not possible to turve, the upper vegetated layer will be stripped and stockpiled for use during reinstatement (as for topsoil in grasslands). Plugs – peat plugs will be placed at 50m intervals within the stone road to maintain the hydrology of the area and prevent the stone road acting as a preferential drainage channel within the bog. Salt Marsh - Turving will also be applied in the area of salt marsh near the Leenamore river crossing.
Environmental management of construction.	The Environmental Management Plan (EMP) will set out key measures to ensure compliance with all relevant commitments set out in this EIS, environmental regulations and standards and to minimise the potential impacts associated with construction. The EMP will include plans and procedures for the effective environmental management of construction.
Environmental policing of construction.	The Environmental Officer, Project Ecologist and Project Archaeologist will provide supervision, monitoring and inspection of the works to ensure that construction is carried out in an environmentally sound manner.