3 CONSTRUCTION

3.1 Construction Methods and Sequence

The Construction Strategy for the offshore field and pipeline is described in the 2001 Offshore EIS. Some construction activities have taken place since 2001, including the installation of the export pipeline from the Corrib Field to the landfall at Glengad, however there are still a number of outstanding activities to be completed. Installation of the pipeline commenced in 2008 using methods described in the 2001 Offshore EIS. Further details of installation methods for a number of components yet to be installed are now available and are described below, along with an updated schedule.

3.2 Construction Sequence

Activities carried out since 2001 on the offshore pipeline route, including the landfall, include the following:

- 2002:

  Glengad Headland landfall site: Most of the topsoil stripping (approximately 80%) undertaken, to a distance of 50m landward of the cliff. A section of the cliff was cut to access the beach and intertidal zone. Following suspension of construction work, the landfall site and the cliff were reinstated.

  Nearshore and intertidal trench Broadhaven Bay: Intertidal causeway was constructed. Part of the trench was excavated and subsequently reinstated using the extracted rock and sand. Causeway was removed.

- 2005:

  Glengad Headland: Temporary construction site established. Following suspension of works the area was reinstated.

  Nearshore Trench: The outer reinstated section of the near-shore trench was excavated and later backfilled.

- 2006 – 2008:

  Corrib Field: Wells completed and Christmas trees installed, new wells drilled, well protection structures and infield flowlines installed, pipeline manifold protection structure installed.

- 2008:

  Glengad Headland landfall site: Topsoil stripped. Temporary construction site established. Cliff cut and site prepared for pipe pull. Following suspension of construction work in October due to worsening weather conditions, the landfall site and the cliff were partly reinstated (topsoil remained in storage area to protect seed bank in preparation for 2009 activities).

  Nearshore and intertidal trench Broadhaven Bay – intertidal causeway was constructed. The intertidal and nearshore trench was excavated and subsequently reinstated. Causeway was removed.

  P5 and P101 wells completed, work carried out on P6, in the in-field area the Manifold module was installed.

- 2009:

  Glengad Headland landfall site: Temporary construction site re-established. Cliff cut and the pipeline bundle pulled in from a pipelay vessel through the cliff to the proposed landfall valve installation site. Cliff fully reinstated. A hydrostatic strength test was conducted on the gas pipeline and the water outfall pipeline.

Nearshore and intertidal trench Broadhaven Bay: Intertidal and nearshore causeway was constructed, trench was excavated with sediment being temporarily deposited elsewhere in the Bay. Pipeline was pulled from a pipelay vessel, through the trench and on to the landfall site. The causeway was removed, and the trench backfilled with the stored material. The section up to approximately 13 kilometres from shore was trenched post-lay. On a part of this section where trenching was not possible, graded rock was placed on top of the pipeline to aid stability.

During the installation of the offshore pipeline, the treated surface water discharge pipeline was also laid (it was attached to the gas pipeline) as far as the discharge location to the North of Erris Head. In addition, a conduit was 'piggy-backed' on the pipeline from the landfall out to around 2.2km from shore. The umbilical will be pulled through this conduit to the landfall site during the installation operation for the umbilical.

Final works associated with the installation of the offshore pipeline will commence in spring 2010 and will involve the deposition of more rock on top of the area that has already been subject to rock placement, and possibly beyond. The rock placed over the installed pipeline in 2009 was a relatively fine grade material, and this will be covered by a heavier coarse grade in 2010, which will provide greater stability against sediment movement. Rock placement is likely to take place during a 3 month period in the summer.

Installation of the offshore umbilical is currently scheduled for 2011. An overall schedule is presented in Table 3-1. The umbilical will be placed in a pre-prepared trench, relatively close to the offshore pipeline route and may require further stabilisation, should trenching not be possible in certain locations.

The schedule could be subject to change as it depends on a number of contracts being agreed, and suitable plant and equipment being available during the summer season of 2010 and 2011.

Table 3-1: Indicative Construction Schedule

Activity	Q1			Q2			Q3			Q4			No. Weeks
2010													
Near-shore Pipeline Survey													2
Offshore Pipeline Protection- Rock Placement													12
Pipeline tie-in to Manifold													2
Rock Placement at Manifold													5
2011													
Umbilical Installation and protection													5
Umbilical tie-in to Manifold													6
2012													
Offshore Pipeline Pre-commissioning													2

Note: Indicative periods where activities may occur have been provided above. Indicative durations are indicated in the right hand column.

3.3 Typical Installation Methods

The installation methods for all project activities have been undertaken in accordance with the methods described in the 2001 Offshore EIS. However, further details on the proposed installation methods of the project elements yet to be installed are now available and are described below.

Additional information is also provided on the tie-in of the offshore pipeline with the Corrib Field Manifold.

3.3.1 Rock Placement

The pipeline will be protected by 'rock placement' where required comprising 2 distinct layers:

- A base/filter layer of rock;
- Rock armour

The base layer or filter layer rock comprises washed and graded material ranging between 25 mm and 200 mm (grade will depend on location). Installation of this layer commenced during Autumn 2009 and it is possible that some remedial rock may be required during the 2010 to take into consideration any movement / washout of rock as a result of the winter conditions in Broadhaven Bay. Any remedial works will be determined by a survey, which is scheduled to take place during Spring 2010.

Placement of the base layer will be undertaken by a fall-pipe vessel that can operate in water depths covering the full length of the offshore pipeline and umbilical route.

The rock armour will comprise washed and graded material of approximately 350mm, sourced from a suitable quarry. As installation of the base layer took place at the end of the offshore construction season it was not possible to install the armoured over layer of rock in 2009.

Placement of the rock armour will be undertaken using one or more side stone casting vessel(s) supported by a bulk carrier, which will transhipp rock to the side stone casting vessel(s). This work is scheduled to take place during the 2010 construction season and may further be required in 2011 after installation of the umbilical.

All rock will be of granite /gneiss type, and will be inert in the marine environment.

3.3.2 Umbilical Installation

An umbilical lay vessel will carry (on a reel) the complete length of pre-manufactured control umbilical to lay from the landfall to the manifold in the Corrib field. A smaller survey vessel will also accompany the vessel.

At the landfall end, with the support of a diving vessel, the end of the wire cable currently inside the umbilical conduit will be attached to a new wire and an internal check will be conducted of the umbilical conduit. Subsequently the new wire will be attached to the end of the umbilical on the umbilical lay vessel. A winch will be set up on the landfall site, and will be used to pull the umbilical through the conduit to its termination. Once that operation has been completed, the umbilical lay vessel will move offshore, trenching and laying the umbilical as she moves. The umbilical will be laid parallel to the pipeline, at a distance of around 20-30m from the pipeline. It is expected that the operation, from arrival in Broadhaven Bay to laying the final part of the umbilical in the Corrib field, will take around 15 days –20 days. The survey vessel will then complete a final route survey to record burial of the umbilical.

During the period between the laying of the umbilical on the seabed and the completion of the trenching operations, guard vessels may be used along the route of the umbilical to ensure that the umbilical is not disturbed by any fishing activities.

As per the schedule presented in Table 3-1, it is envisaged that umbilical installation will take place during the 2011 offshore construction season.

3.3.3 Completion of Pipeline tie-in to Corrib Field Manifold

A subsea construction vessel equipped with remotely operated vehicles (ROVs) will complete the tie-in of both the pipeline and the umbilical into the Corrib manifold. The tie-in of the pipeline is planned to take place in summer 2010, the umbilical tie-in after installation of the umbilical in 2011. ROVs will be used to connect a spoolpiece to the end of the pipeline, which then connects into the manifold. The inclusion of the spoolpiece will allow for any thermal expansion in the offshore end of the pipeline during operation. ROVs will then connect the umbilical directly into the manifold control system. Protection will be applied following the respective completion of the umbilical and pipeline tie-in.

3.3.4 Offshore Pipeline (Pre-) Commissioning Activities

A similar vessel will provide pipeline and umbilical pre-commissioning support.

The offshore pipeline is currently filled with inhibited sea-water and will need to be tied into the completed landfall valve installation at Glengad.

During the commissioning phase, a mobile nitrogen generation plant will be established adjacent to the LVI compound at Glengad for a period of one to two weeks.

This station will include a series of mobile diesel generator units, which will generate emissions of combustion gases. Soundproofing will be provided to ensure that noise levels will be within acceptable limits.

The offshore pipeline will then be dewatered over a period of approximately 14 days. Using pipeline integrity gauges (pigs) propelled by nitrogen, the pigs will move from onshore to offshore, pushing the water out of the offshore pipeline to be disposed of at the manifold. The total quantity of hydrotest water to be discharged from the offshore pipeline will be approximately 14,000 m^3.

It is currently proposed that the offshore pipeline will be pre-commissioned in the summer of 2012, to coincide with suitable weather conditions required for the associated offshore operations.

Details on the pre-commissioning of the onshore pipeline can be found in the RPS Onshore Pipeline EIS 2010. The umbilical will be tested from the terminal to prove its integrity and that full communication with the subsea facilities has been established.

3.4 The Onshore Pipeline

The section of the pipeline from the landfall to the terminal is addressed in the RPS Onshore Pipeline EIS 2010.

3.5 Onshore Valves and Termination Unit

The offshore pipeline and umbilical will terminate in a special facility a short distance behind the landfall. This facility, known as the landfall valve installation (LVI), will be constructed in a low-profile arrangement with much of the system buried below ground. The onshore pipeline and onshore section of the umbilical will join with the offshore elements in the LVI. The LVI is addressed in the RPS Onshore Pipeline EIS 2010. The offshore pipeline currently terminates within the boundary of the construction compound at Glengad. The pipeline has been capped and buried, and will be re-excavated during the construction of the onshore pipeline, at which time the LVI will also be fully constructed.

3.6 Mitigation Measures during Construction

A number of mitigation measures will be implemented during the construction phase to minimise as far as possible the impacts to local residents and the environment. These are contained within the Environmental Management Plans for the offshore works. Method Statements for all construction activities within the candidate Special Area of Conservation (cSAC) will be prepared and be subject to approval of National Parks and Wildlife Service (NPWS) prior to commencement.

3.6.1 Noise

For marine based work in the intertidal and subtidal zones, activities will run on a 24-hour basis. For the land-based operations at Glengad, working hours will in general be restricted to 07:00–19:00 Monday to Friday, 07:00–16:00 on Saturday and there will be no activity on Sundays. During the umbilical pull-in operation, it will be necessary to work on a 24-hour basis.

Noise will be minimised by the screening of stationary machinery (generators), use of noise attenuation barriers and turning off such equipment when not in use. Silenced machinery will be used as much as possible to mitigate noise.

Certain commissioning activities for the offshore pipeline may require 24-hour working. However, current information in respect of the pre-commissioning of the offshore pipeline indicates that this activity would need to be restricted due to elevated noise levels arising from the nitrogen generating plant and associated compressors. If, however, further noise attenuation measures can be identified and proven to reduce noise levels to an acceptable target, it is proposed to carry out this work on a 24-hr basis. Should further noise attenuation not be available, this activity will be curtailed, and not carried out during the period 22:00 – 07:00.

Recognising that noise will be of concern, SEPIL will ensure that local residents are informed of the programme of work proposed, and the dates when 24-hour working may occur.

3.6.2 Light

When night time work is necessary, lights will be directed away from residences and roads as much as practicable. However, as the safety of the crew is paramount, some disturbance may be unavoidable.

3.6.3 Oil Spill

Onshore re-fuelling will be restricted to allocated re-fuelling areas. Offshore re-fuelling will be carried out using procedures designed in accordance with industry best practice. In the event of an oil/diesel spill, offshore and onshore emergency procedures will be implemented as necessary. Oil spill response containers are stationed at each site and each machine driver is equipped with and trained to use an oil spill kit in the cabin of the machine.

3.6.4 Archaeology

Offshore archaeological monitoring has taken place in Broadhaven Bay in all previous construction periods.

Whilst the marine pipe trench was archaeologically monitored in 2002, 2005, 2008, and 2009 and nothing was found during this work, there still may be potential for archaeological remains to be uncovered during the remaining works, if any deviation from the original routes occurs.

The Department of Environment, Heritage and Local Government (DoEHLG) will require a monitoring licence for any new marine trenches or onshore topsoil stripping in areas not stripped previously.

Contingency plans to deal with such an eventuality will be put in place for the remaining construction phases.

Given the previous monitoring which has been carried out in the area, the Underwater Archaeology Unit of the DOEHLG have confirmed that no further archaeological monitoring will be required for the umbilical installation works.

3.6.5 Ecology

During construction, a working area will be fenced off at the landfall to prevent encroachment by personnel and machinery outside of the allowable work area and to protect the adjacent habitats. There will be adequate signage to further delineate this boundary.

Ecological surveys will be carried out during the construction period to monitor the activity of species of particular conservation interest in the vicinity of the construction operations. These surveys are part of the ongoing environmental monitoring programme put in place by SEPIL to ensure that any impacts are minimised as far as possible.

Marine mammal observers will be present during marine construction operations in Broadhaven Bay and adjoining coastal waters. They will make a visual search of the area before any marine works are due to commence and any noisy operations will be delayed until 20 minutes after the last sighting of marine mammals within 1000m of the construction spread. A code of conduct developed and agreed with NPWS to minimise disturbance to marine mammals from construction activities will be implemented.