Route Selection Process & Alternatives Considered

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1. *My name is Ciarán Butler and I am Technical Director in RPS Consulting Engineers. I manage the Energy Section of the Company and I have been with RPS since 1996. I am currently the RPS Project Manager with the Corrib Onshore Pipeline project including the selection of a modified route.*

1. Qualifications & Experience

2. I qualified as a Mechanical Engineer in University College Dublin in 1994. I also graduated with a Masters of Engineering Science degree in 1996. I am a Chartered Engineer and a member of Engineers Ireland.

3. My relevant experience to this project includes management, engineering, planning and environmental responsibilities on gas pipeline projects with Bord Gáis Éireann (BGE) including

- Abbotstown & Poolbeg AGIs (1998 – 1999). This was the design and construction supervision of two Above Ground Installations (AGIs).
- Gas 2025 Irish Natural Gas Infrastructure Preliminary Engineering (1999). This involved the assessment of approximately 1,000km of alternative pipeline routes in Ireland.
- Gas Pipeline to the West – Planning, route selection and detailed engineering (2000 - 2001)
- Gas Pipeline to the West – Construction Supervision (2002).
- Second Gas Interconnector Landline (IC2) – Planning, Routing and Construction Supervision (2002)
- Dublin Network Renewals Project (2005 -2006).

2. RPS's Brief

4. RPS was appointed by Shell E&P Ireland Ltd. (SEPIL) in January, 2007. We have extensive experience with:

- Natural gas pipelines including the Gas Pipeline to the West and the South-North Pipeline.
- Environmental Impact Statements for large scale linear development and infrastructure projects
- Local community consultation

5. Our Brief resulted from the recommendation of Peter Cassells in his '*Report and Recommendations from Mediation*' (2006). This was to:

> '*modify the route of the Onshore Pipeline in the vicinity of Rossport in order to address community concerns regarding proximity to housing'*.

3. Summary of Evidence

6. My objectives in this Statement are to explain how the optimum route for the Corrib Onshore Pipeline was identified and selected and to outline how the layout of the proposed Landfall Valve Installation (LVI) was chosen. These issues are described in Chapter 3 of the EIS Main Report. My evidence includes a description of:

- Identification of the Study Area
- Development of Criteria for Selecting the Optimum Route
- Assessment of the alternative corridor and route options
- Selection of the optimum route
- Detailed routing
- Description of the alternative layouts considered for the Landfall Valve Installation (LVI)

Slide 1 – Proposed Pipeline Route

7. I will begin with the proposed pipeline route. The proposed route strikes the optimum balance of all criteria. It takes into account relevant community, environmental and technical factors. It meets the requirements of the Applicant and satisfies all planning needs.

4. Identification of the Study Area

Slide 2 – Study Area

8. The study area within which a modified route would be sought, was defined as an arc form around the permitted Gas Terminal at Bellanaboy Bridge, extending from the Barnatra / Inver area in the south west to a locally identified potential landfall at Glinsk / Laghtmurragha in the north-east of the Erris area. This area incorporates a significant portion of the entire Erris area. (Slide No. 2 shows the study area).

5. The Route Development Methodology

9. The methodology that was used by RPS to select a modified route for the Corrib Onshore Pipeline included:

- Development of Route Selection Criteria

- Identification of Indicative Route Corridors (desk based study and visual surveys)
- Short-listing of Route Corridors (including on-site surveys of sections of corridors)
- Detailed Corridor Development (including on-site surveys of Short-listed Corridor Options)
- And finally, Route Finalisation (which included further survey work where required)

Information on this process is provided in Chapter 3 of the EIS Main Report.

5.1 Development of Route Selection Criteria

Slide 3 - Consultees

10. Slide No. 3 shows the list of statutory bodies and non-statutory organisations and other stakeholders with whom we consulted. The local community, local landowners, residential and business communities were also consulted. This also involved a workshop in Geesala with participants drawn from the local community. The consultation and engagement process is addressed in more detail in a separate statement to this Hearing, and in Chapter 2 of the EIS Main Report.

Slide 4 – Route Development Criteria

11. A detailed set of criteria for pipeline route selection, grouped under the broad headings of community, environmental and technical criteria, were developed by RPS on the basis of our professional experience and judgment, project requirements and consultation with all stakeholders. The criteria are listed on Slide No. 4 and are set out in detail in Section 3.4.11 of the EIS Main Report. They were as follows:

Community Criteria

- Maximise Safety
- Minimise impacts on people
- Proximity to dwellings / public centres
- Planning / Land use
- Landowner consent and number of affected landowners / residents

Environmental Criteria

- Minimise impacts on wildlife and habitats
- Avoid impacts on archaeology and cultural heritage
- Minimise visual impact

Technical Criteria and Project Requirements

- Pipeline construction and operation
- Optimise pipeline design and operation
- Minimise pipeline length and distance to the offshore gas field
- Location of and access to landfall installation
- Impact on project programme and economic factors

12. The evaluation process was qualitative. No weighting was applied to any of the criteria. However, safety was identified by SEPIL, RPS and members of the community as being a necessary requirement of any proposed route.

5.2 Identification of Indicative Route Corridors

13. When selecting the route of a pipeline or any other linear development, the shortest possible route is generally preferred. In practice, however, the final route of any pipeline or other linear development will be determined by community, environmental and technical criteria.

14. Having established the Route Selection Criteria and the Study Area, all available data was gathered for the area (e.g. mapping, locations of designated conservation sites, locations of peatlands, aerial photography). A number of desk based studies were also carried out including flora & fauna, archaeology, geology and landscape. This information was used to provide qualified and experienced pipeline routing engineers and other specialists with detailed material to input into the route development process. In this format, all potentially sensitive and/or constraint areas for landfall and pipeline construction were identified.

15. In addition, on-site visual and vantage point surveys of the study area were undertaken by qualified and experienced professional civil, mechanical and pipeline construction engineers, planners, ecologists, geologists and other specialists. This included surveys of potential landfall sites.

Slide 5 – Corridor Options Considered

16. Eight indicative corridors (approximately 300m wide) were presented publicly in June, 2007. (Slide No. 5 shows the eight corridors. These are labelled A to H. Slide No.6 shows the eight corridors with environmentally designated areas (SACs / SPAs) shaded).

Slide No. 6 – Corridor Options showing Environmentally Designated Areas

17. All Route Corridor Options, including necessary landfall points, were considered to be potentially technically possible at that stage. However, the options were not necessarily considered to be of equal merit under all identified selection criteria.

5.3 Short-listing of Route Corridors

18. In order to facilitate the short-listing process, the characteristics of each corridor were evaluated qualitatively against the route selection criteria, by a multi-

disciplinary project team of engineering, technical, environmental and land use specialists.

19. Site surveys took place at this stage to confirm the status of some areas where particular features were identified so as to facilitate the short-listing process. It was not necessary to engage in detailed or intrusive surveys of all corridors at the strategic corridor short-listing stage.

20. Each of the eight corridors was found to have its own range of environmental, technical and/or community constraints when evaluated against the various selection criteria. None of the corridor options were free of constraints. The selection process from this point therefore sought to find a route corridor that achieved the optimum balance between all agreed selection criteria.

21. Whilst having regard to the brief, deriving from the Cassells recommendation to modify the approved route, the comparative evaluation process included consideration of the previously approved pipeline route, in the context of the revised route selection criteria.

Slide 7 – Short-listed Corridors

22. Corridors A, B and C were short-listed for the following reasons: (This is set out in detail in Section 3.4.1.4 of the EIS Main Report. The short-listed corridors are shown on Slide No.7):

- These corridors are relatively short and direct in comparison with other corridors. Their benefits include minimising construction impact, minimising environmental intrusion, and minimising impact on flow assurance in the gas pipeline - ensuring shorter overall routes between wellheads and terminal.
- These corridors avoid for the most part areas of dense habitation as far as possible. This issue emerged as being of key importance to local communities, in particular proximity to local habitation and individual homes.
- Corridors A, B and C use the previously approved landfall at Glengad which has been demonstrated to be feasible from the offshore approach and pipeline pull-in perspectives.

Slide 8 – Corridor Options showing Environmentally Designated Areas

23. Although corridors A, B & C traverse a portion of the Glenamoy Bog Complex (SAC) across Sruwaddacon Bay and/or intact blanket bog, it was envisaged during this high-level evaluation of the identified corridors that significant potential adverse impacts to these sensitive environments might be mitigated through careful specific route selection following detailed survey and assessment, and the development of appropriate construction methodologies.

24. The main reasons for not choosing corridors D (Inver Upland)), E (Inver/Barnatra), F (Portacloy), G (Glinsk) & H (North Bay) for further assessment are outlined below. (It should be noted that this is not an exhaustive list).

- In terms of proximity to local habitation and individual homes, including potential planning/land-use impacts, Corridors D and E were closer to the clustered settlement around Inver (including Gortmelia and Gortbrack), where there is considerably more clustered habitation and development potential.

- In terms of proximity to local habitation and individual homes, including potential planning/land-use impacts, Corridor F was constrained by the clustered habitation and development potential around Portacloy.

- The landfalls at Corridor F (Portacloy) and Corridor G (Glinsk) had significant disadvantages in terms of inshore technical constraints and difficulties with pulling-in the offshore pipeline due to the rocky and steep coastline. The coastline at Corridor G includes steep sea cliffs that are easily in excess of 100m high.

- Corridor H (North Bay) had significant environmental constraints due to the characteristics of the habitat in this location, as it was considered that it would not be possible to construct the landfall there without residual adverse impact on the Machair habitat, which exists at that location. Machair is an EU Habitats Directive, Annex 1 Habitat. Additionally, the offshore approach to a landfall at North Bay could have had significant impact on the sand formations at the mouth of Sruwaddacon Bay where tidal flows are very strong making construction and mitigation measures more difficult.

- Corridor G between Glinsk / Laghtmurragha and the Bellanaboy Bridge gas terminal, traversed the Glenamoy Bog Complex SAC for approximately 5.5 km. There is a very restricted road network in this area which would have great difficulty in accommodating expected movements of construction and maintenance vehicles. It was considered that it would not be possible to reinstate a pipeline route in this area without significantly impacting on the Glenamoy Bog Complex (SAC).

- Corridor G (Glinsk) would add over 20km to the length of the offshore pipeline and approximately 5km to the length of the onshore pipeline route, with associated flow and pressure disadvantages. This was a major disadvantage of Corridor G.

- Corridor F (Portacloy) required an additional length of onshore pipeline of approximately 5km and an additional length of offshore pipeline of approximately 5km. This was a major disadvantage of Corridor F.

5.4 Detailed Corridor Development

Slide 9 – Short-listed Corridors

25. Following the short-listing of corridors, RPS undertook a more detailed study of route corridors A, B and C. (These are shown again with environmentally designated areas on Slide No. 9). This involved further desk top and on-site surveys where these were possible. In addition, detailed analysis took place in respect of elements applicable to all potential routes, such as the development of construction methodologies. Also, the design and location requirements of a

Landfall Valve Installation was considered. This was identified as the best solution for implementing the key recommendation of the Advantica Consultants Independent Safety Review in respect of the previously approved pipeline to limit the pressure in the onshore pipeline. Consultation with the local community and other stakeholders including Mayo County Council, the DoEHLG, the DCENR and An Bord Pleanála, under the provisions of the Strategic Infrastructure Act, was ongoing at this time.

Slide 10 – Corridor Variations

26. Though short-listed, primarily in view of its relative distance from dwellings, it had been identified from an early stage that Corridor A traversed intact blanket bog, which is an EU Annex 1 listed priority habitat. In the early stages of route selection it was considered possible to minimise the potential impact of pipeline development on this habitat, through careful route selection and the application of suitable construction methodologies. However, following further survey and assessment of this potential corridor, it became clear that there was a need to vary Corridor A. Similarly, after further consideration of potential construction methodologies within Sruwaddacon Bay, it became clear that trenchless crossings much longer than 1km would be difficult to achieve without an intermediate pit within the bay. Therefore, variations to Corridors A and Corridor C emerged during this stage of the route development process. (Slide No. 10 shows these variations).

Slide 11 – Corridor Variations showing Environmentally Designated Areas

27. (Slide No. 11 shows the corridor variations with environmentally designated areas). The variation to Corridor A was chosen to minimise potential adverse impacts to the Glenamoy Bog Complex (SAC) in Rossport. The variation of this corridor was identified as Corridor A1.

28. The variation to Corridor C emerged as a means of reducing the length of the crossing of Sruwaddacon Bay (SAC/SPA) via a section of Corridor A1. This corridor was identified as Corridor C1.

29. The ongoing comparative and qualitative evaluation process proved to be robust, allowing the Project Team to continuously assess new information against the established selection criteria. This iterative process meant that previous evaluation could be reviewed, and if necessary, revised, as new information came to light, for example through survey work, or through ongoing consultation and engagement.

5.5 Route Finalisation

30. The various stakeholder, environmental, technical and other professional experts of the RPS and SEPIL Project Team engaged in a process to evaluate the identified short-listed corridors and their variations. Other crucial aspects of the onshore pipeline project, including construction methodologies, technical constraints and alternatives were assessed.

31. The evaluation process took place in three stages:

1. Evaluation against the selection criteria of the short-listed corridors and their variations in the context of all data that had been obtained. This evaluation process also included the previously approved onshore pipeline route. This evaluation process confirmed Routes A1, B and C1, as the shortlist of preferred options. At this stage of the process, the short-listed corridors were evaluated as routes.

2. A more focused highlighting of potential advantages and disadvantages of these identified corridor options was carried out. This process highlighted the fact that each option had a series of similar characteristics, but also different advantages and disadvantages. As was indicated from an early stage in the route selection process, the final preferred route would have to be the one which offered the optimum balance between the various selection criteria.

Slide 12 – Corridor C1

3. *(Slide No. 12 shows Corridor C1).* The assessment process resulted in the identification and selection of Corridor C1, as having the most appropriate balance between the various community, environmental and technical selection criteria. Some potential constraints were identified, but these were considered to be capable of being mitigated by means of specific routing within the corridor and appropriate construction or operating methodologies; such measures have been identified in the Environmental Impact Statement.

32. The main reasons for selecting Route C1 are outlined in Section 3.4.1.6 of the EIS Main Report: These are summarised as follows:

- The proposed route achieves a minimum separation of 140m from existing occupied housing. This is double the minimum proximity to housing of the previously approved route and meets the requirements of Cassells Report in relation to proximity to housing in the Rossport area. It should be noted however, that such separation distance is what can be achieved on the ground in the vicinity of the identified route. It is not a technical or statutory requirement, relating to a minimum proximity distance to housing.

- The proposed route is located on the fringes of the Glenamoy Bog Complex (SAC) and minimises any potential impact on this designated site. In addition, the upper crossing of Sruwaddacon Bay largely avoids those inter-tidal areas of the bay that are most favoured by over wintering and resident bird species.

- The preferred construction methodology for the crossing of Sruwaddacon Bay uses trenchless technology. Route C1 represents the optimum route for trenchless crossings because of its shorter upper bay crossing compared with Routes B and C. (A separate statement on the proposed construction methods will be given later).

- The shorter upper crossing of Sruwaddacon Bay on the proposed route is an advantage regardless of construction methodology because the works

can be completed in less time and therefore will minimise impact on the bay.

Slide 13 – Corridor Variations

33. The main reasons for not choosing routes A, A1, B & C (see Slide No. 13) were as follows:

- Corridor A traverses longer and more sensitive areas of intact blanket bog, including bog pools, in Glenamoy Bog Complex (SAC).

- Corridor A1 crosses a longer section of bog within the Glenamoy Bog Complex(SAC).

- Corridor A1 is over 1.5km longer than Corridor C1 and is not as direct.

- The bay crossing on Corridor B is approximately 40% longer than the proposed route C1. Although this could be constructed using a trenchless method, there is greater risk of technical difficulties due to the additional length.

- A section of Corridor B is within the catchment of the Aghoos branch of the Bellanaboy River which flows into Carrowmore Lake (the main source of local drinking water and a designated conservation site (SAC and SPA). There would therefore be some potential risk of impact to these water bodies during the construction period from surface water run-off.

- The bay crossing on Corridor C is approximately 3.6 times longer than the upper crossing on the proposed route. Alternative specialised construction methods were examined for this length of crossing. It was found that trenchless construction options would require a combination of technologies and a number of intervention pits within the bay. This would greatly increase the complexity and risk associated with the operation. An open cut crossing would have a higher risk of interfering with the hydrodynamics of the bay i.e. the flow of water in and out of the bay. As Route C has a much longer section within Sruwaddacon Bay it would be more likely to impinge on periods of seasonal environmental sensitivity. It is likely that the operation would extend over two construction seasons. It was therefore concluded that choosing Route C would be untenable in terms of the EU Habitats and Birds Directives on a project where alternatives clearly exist.

Slide 14 – Proposed Pipeline Route

34. It is considered that Route C1 represents the optimum balance of all route selection criteria. It achieves a significant increase in separation distance from local dwellings while minimising potential impacts on designated conservation sites. None of the alternative options achieved the same balance.

5.6 Detailed Routing

Slide 15 – Construction Plan Drawing

35. I will now describe the proposed route for the Corrib Onshore Pipeline in detail. I will do this with the aid of extracts from the Application Drawings. On these drawings, the proposed pipeline route is shown as a blue line. The Temporary Working Area is shown as a dashed yellow line. References to 'chainage points' or 'chainages' are in kilometres measured from the wellhead. For example, the landfall at Glengad is located at approximately chainage 83.40. This means that it is approximately 83.40km from the wellhead. I will highlight where the proposed route is different to the 2002 pipeline route.

Slide 16 – Section 1

36. The Corrib Pipeline makes landfall at Glengad. The alignment of the onshore pipeline in this area is determined by the offshore approach, which itself generally comprises the shortest distance to the wellheads. The pipeline follows this alignment in Glengad for approximately 300m.

Slide 17 – Section 1 showing SAC

37. A section of the proposed pipeline and the proposed Landfall Valve Installation (LVI) are within the Glenamoy Bog Complex (SAC) at Glengad. The extent of the SAC in this area is shown on Slide No. 17. There is no EU Annex I Priority Habitat at the landfall where the pipeline comes ashore; it is improved agricultural grassland. Priority Habitat does exist to the north of this location. However, construction of the pipeline and LVI will not pose a risk to this sensitive habitat and amenity.

Slide 18 – Section 2

38. At chainage 83.686 the route turns in an easterly direction to align the route with that of the Lower Crossing of Sruwaddacon Bay. The pipeline route at this location in Glengad achieves a balance between reducing the impact on agricultural activities and avoiding impact on the ecologically sensitive sand dune system to the north. In addition, this alignment maximises the distance of the pipeline from existing occupied dwellings along the L1202. From this point, the pipeline follows a straight line for over 800m, primarily under Sruwaddacon Bay to the Rossport side of the Lower Crossing.

Slide 19 – Section 3

39. At approximate chainage point 84.565 in Rossport, the pipeline turns south to follow the coastline in agricultural land south of the Sean Mhachaire Road (L52453-25). The route of the pipeline from chainage 84.565 to approximate chainage 84.80 was selected to avoid areas of archaeological potential (as shown on the Alignment Sheets in Appendix A of the EIS Main Report) and to maximise the separation distance from existing occupied dwellings.

40. At approximate chainage 84.810 the pipeline route turns south east. The route in this area generally follows the coastline to chainage 85.552 in such a way as to allow space for construction while avoiding excessive slopes and to reduce

impact on agricultural activity in the area that might occur through temporarily dividing land strips. (Land ownerships in this area are mostly divided into long strips that extend from the public road (L52453-25) to the foreshore).

41. At chainage 85.552, the pipeline route begins to turn in a north easterly direction. It is at this point that the modification to the original, 2002 pipeline route begins. From here, the route crosses the public road (L52453-25) at a location designated Road Crossing 1 (RDX1). It continues in the same direction for approximately 150m before turning east into the Rossport Commonage area (approximate chainage 85.98).

Slide 20 – Section 4

42. The previously approved pipeline route continued to follow the coastline in a similar manner from chainage 85.552 through to the area of Rossport Commonage that extends to the foreshore, some distance to the south east. At a number of locations on this section of the original pipeline route, the minimum proximity to normally occupied buildings was approximately 70m.

43. By selecting a route through Rossport Commonage, the modified route now proposed, achieves an increase in the proximity to existing normally occupied buildings. This was a fundamental recommendation of the Cassells Report. From the location where the modified route begins, to the point where it enters Rossport Commonage, the minimum proximity from existing normally occupied buildings is approximately 140m.

44. On the north / east side of RDX1 (L52453-25) the proposed pipeline route passes within 10m of one existing house and within 30m of another existing house. These buildings have not been in regular occupation for several years. SEPIL has made arrangements that these buildings be removed from use for the duration of the operation of the pipeline.

45. The pipeline route turns to the east and enters the Rossport Commonage at approximate chainage 85.98. The topography on Rossport Commonage rises gently to a high point at approximate chainage 87.00. The route generally follows this course while staying slightly to the northern side of slopes i.e. those falling away from the public road L52453-25.

46. Much of this area is heavily cut over bog and it is acknowledged that the route will impact on some active turf plots in this area.

47. At approximate chainage 87.00, the pipeline route enters an area of undisturbed bog. Environmental constraints occur in this area in the form of a system of bog pools at approximate chainage 87.37. The route veers slightly to the north to minimise impact to these. The first of these turns occurs at approximate chainage 86.96 and the second at approximate chainage 87.23. From this point, the route continues in a south easterly direction and enters another heavily cut over section of bog before reaching the Léanna Mhianaigh Road (L52453-0) at a location designated 'Road Crossing 2' (RDX 2).

Slide 21 – Section 4 showing SAC

48. After RDX 2 (L52453-0), the pipeline route enters an area of bog that is within the Glenamoy Bog Complex (SAC). The extent of the SAC in this area is shown on Slide No. 21. From RDX 2, the pipeline generally keeps to the edge of the SAC. At chainage 88.07, the route is less than 20m from the land boundary to the south. At chainage 88.10, the route turns to the south and continues for approximately 220m towards the L52453-25 at 'Road Crossing 3' (RDX3). The route within the SAC has been kept as far as practicable to the edge of the SAC in order to minimise potential impact to the SAC.

Slide 22 – Section 5

49. At RDX 3 (L52453-25), the route continues south to align with the Upper Crossing of Sruwaddacon Bay. This crossing point (on the northern side of Sruwaddacon Bay) is a result of keeping the pipeline route as close as possible to the edge of the Glenamoy Bog Complex (SAC) and the requirement for the alignment of the proposed crossing to be straight. The point where the Upper Crossing meets the southern side of Sruwaddacon Bay was selected on the basis of maximising distance to local housing, available space, and minimising potential impact on areas of identified archaeological potential.

Slide 23 – Section 6

50. On the southern side of Sruwaddacon Bay, the pipeline route turns east at approximate chainage 89.75. The alignment in this location has been chosen to maintain greatest separation from the house located close to the Leenamore River and to avoid areas of archaeological potential. The indicated crossing point of the Leenamore River has been chosen to reduce the width of the crossing in this area and so potential environmental impact.

Slide 24 – Section 7

51. The pipeline route continues in the same direction for approximately 1,000m. The proposed pipeline route intersects with the 2002 pipeline route at approximate chainage 91.77. Instead of rejoining the original route at this point, the modified route continues on the same heading for a further 80m before beginning to turn south. This local diversion from the original pipeline route has been chosen in order to avoid direct impact to the triangular section of bog at Bellagelly South. This can be seen clearly on Slide No. 24. The pipeline route crosses the public road (L1202-116) at a location designated as 'Road Crossing 4' (RDX 4), close to chainage 91.00.

52. At chainage 91.20, the modified route rejoins the original pipeline route and continues to the Gas Terminal in a southerly direction for a further 1,100m or so within previously forested areas. At approximate chainage 92.34, the route turns south east to tie in with the Gas Terminal.

6. Landfall Valve Installation (LVI)

53. The original pipeline, for which consent has been given, included an onshore isolation valve located at Glengad. This allowed the onshore section of the pipeline to be isolated manually from the offshore pipeline. The relative simplicity of the valve system meant that the isolation valve could be sited below ground level, within a small above ground fenced compound.

54. SEPIL has accepted the recommendations of the Advantica Report to provide a fail safe isolation valve for the Onshore Pipeline incorporating a pressure limitation feature, designed to comply with the relevant codes and standards. The installation now proposed is thus more complex than that originally planned.

55. I will now explain the basis for the proposed layout of the Landfall Valve Installation (LVI).

Slide 25 –View from L1202

56. Following identification of the preferred landfall location at Glengad, as detailed above, and in Chapter 3 of the EIS Main Report, the Project Team examined alternative design and siting proposals to implement this recommendation. In particular, this included technical and design options for the overall valve system. It also included consideration of the implications for compliance with the policy of the Mayo County Development Plan to ensure that such development does not adversely interfere with the identified protected view and prospect northwards over Sruwaddacon Bay at Glengad, as viewed from the public realm – the L1202.

57. The technical and mechanical design aspects of the proposed LVI were undertaken primarily by JP Kenny Consulting Engineers. These will be addressed in a separate statement to this Hearing. Given the complexity of any such facility to meet the recommendations of the Advantica Report, all design options had similar characteristics as follows:-

- Buried valves connecting into the underground pipeline;
- Some above ground structures. These could comprise above ground actuators, ventilation equipment, above ground access, and a removable roof if the LVI were to be designed as an underground installation.
- An inner security fence surrounding the LVI. This is required to be 2.8m high, and is intended to prevent unauthorised or accidental access into the area of the installation. In addition, a 1.35m high stock-proof boundary fence is required for all options.
- An access road from the public road (L1202) is required, with a hard-standing area to facilitate periodic access by maintenance vehicles including a mobile crane;

Slide 26 – LVI Alternative Layouts

58. In the context of these generic technical requirements, four alternative layouts were considered for the LVI. These are described in Section 3.5.2 and Figure 3.5 of the EIS Main Report. The alternative LVI layouts are shown on Slide No. 26. They were:

- Conventional above ground facility. (this is shown at the top of the slide);
- Facility on cliff edge;
- Underground and enclosed facility; and
- Facility in excavated lower terrain position (dished).

I will now describe each of these in turn.

Slide No. 27 – LVI Option 1

6.1 Option1: Conventional Above Ground Installation (AGI)

59. The facility is set at existing local ground level and located approximately 27m from the cliff edge to avoid a sand martin colony (as detailed at Chapter 12 of the EIS Main Report and in a separate statement to this Hearing).

60. The plan area of the LVI in this format is approximately 25m x 23.5m with an adjoining hard standing area of approximately 25m x 10m. The facility is surrounded by the inner 2.8m high security fence and an outer 1.35m high boundary fence. The facility would require access via a 4.5m wide double gate. The installation would include above ground actuators, set within cages, and an instrumentation cabin approximately 2.6m high. Lighting and security columns (6m high) are located within the inner compound. It was considered that this option set at existing ground level, would adversely interfere with the protected view.

Slide No. 28 – LVI Option 2

6.2 Option 2: Installation on Cliff Edge

61. The facility comprises a variation on the conventional above ground facility as detailed above, and requiring the same fencing and other external facilities. However it would be set into the cliff edge, such that the level of the actuators could be lowered to approximately 3m below local ground level.

62. This option would require a 2.5m high reinforced concrete retaining wall on three sides, with the 2.8m high security fence on top of the wall. The security fence would therefore rise above ground level. A pedestrian access including concrete stairs and security gate is required. The plan area of this layout is approximately 15m x 15m. This option would have a similar visual impact as for the conventional AGI described above. In addition, there are significant potential adverse implications in respect of the established sand martin colony, in relation to long-term stability of the cliff face and in relation to the exposure of equipment to the saline environment.

Slide No. 29 – LVI Option 3

6.3 Option 3: Underground and Enclosed Installation

63. The facility also comprises a variation on the conventional above ground facility, but is contained in a substantial concrete structure below local ground level. The significant lowering of the level of the actuators and associated equipment would have a consequence for the level of the underground pipeline as it would be much deeper.

64. The interior of the structure would require forced ventilation in accordance with established gas safety industry standards, thereby adding to the complexity of requirements for power and mechanical equipment. In addition, to ensure the proper maintenance of valves and other equipment, the roof of the underground compartment would need to be removable to allow ongoing periodic maintenance of the valves. A hard standing area is therefore required next to the underground facility for a mobile crane. Other above ground elements would include ventilation flues and an access for maintenance staff.

65. The underground option would still require a 2.8m high security fence at local ground level. It must be considered therefore that an underground facility would have no lesser visual impact across the landscape than the conventional AGI or Cliff Edge Installation described above. However, it would have significant implications in terms of intrusion into the landscape by substantial concrete structures, and a greater complexity.

Slide No. 30 – LVI Option 4

6.4 Option 4: Installation in Excavated Lower Terrain Position ('Dished' Option)

66. The facility comprises a variation on the conventional above ground facility with an instrumentation cabin and above ground actuators above the underground pipeline. The finished ground level within the compound is lower than the natural ground level by approximately 3m and is surrounded by grassed slopes. The 2.8m high security fence is set at the lower level, and thus it will not intrude above the surrounding local land level.

67. In the context that the system design of such an isolation valve facility is required to comply with the recommendations of the Advantica Report, this option was considered to be the most appropriate alternative for the LVI, as it has the following advantages:

- It complies with all relevant gas industry standards, and in particular has good natural ventilation, and good vehicular and operational access.

- It effectively minimises the visual impact of the facility, when viewed from the protected view from the public realm of the L1202 northwards over Sruwaddacon Bay (this is addressed in more detail in a separate statement to this Hearing and in the photomontages included in Appendix A of the EIS (Volume 2)).

- Finally, it minimises potential disturbance to the sand martin colony in the cliff area.

68. Detailed measures will further minimise any potential visual or other impact of the LVI including colour scheme, allowance for natural regeneration of the access road to the facility, side slopes and hard-standing area, and the careful design and siting of the drainage outfall at the cliff edge.

Slide 31 – LVI Alternative Layouts

69. In summary, the dished option (Option 4) is the most appropriate layout for the Landfall Valve Installation and is the layout proposed. It is the simplest arrangement and has the least visual impact. Models of the proposed Landfall Valve Installation are here today for viewing.

6. Conclusions

Slide 32 – Proposed Pipeline Route

70. My objective in this statement was to explain how we selected the optimum route for the Corrib Onshore Pipeline and to explain the basis for the chosen layout of the proposed LVI. To sum up:

- The criteria for selecting a modified route for the Corrib Onshore Pipeline were developed in consultation with the local community and in consultation with a wide range of statutory and non-statutory bodies.
- The route development process has been open and transparent.
- The proposed route is safe. It meets all relevant codes and standards.
- The route is 140m from existing occupied dwellings. It achieves the recommendation of the Cassells Report to modify the onshore pipeline in the vicinity of Rossport. There is a significantly greater separation distance between the proposed route and occupied houses than occurred with the previously approved route.
- The proposed route minimises potential impact to environmentally sensitive and designated conservation sites. This has been achieved through careful route selection and the proposed use of specialised construction methods.
- The proposed route and LVI layout are consistent with local planning policy and development management objectives.
- The proposed route achieves the optimum balance of community, environmental and technical criteria developed for this project. Route C1 is acceptable under all criteria.
- Finally, the proposed route meets the requirements of the Applicant for the Corrib Field Development.

71. In conclusion, as the RPS Project Manager responsible for finding a modified route for the Corrib Onshore Pipeline, I am satisfied that the proposed route is the optimum route. I am also satisfied that the proposed layout of the LVI is the best option. The proposed development is in accordance with the proper planning and sustainable development of the area.

This concludes my statement. Thank you.

Ciarán Butler

18th May, 2009