Galway Harbour Company

Galway Harbour Extension

Environmental Impact Statement

Chapter 3

Alternatives

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3 BACKGROUND

Galway Harbour Company proposes to develop additional port facilities in Galway City adjoining the existing harbour. The primary purpose of the new facilities is to address the severe operational constraints within the existing harbour due to restricted access, inadequate draft, inadequate quay length and uneconomic vessel size capacity. The existing harbour serves a range of functions including freight, off shore exploration, international cruise and marina. The proposed facility, which will be known as the Galway Harbour Extension (GHE), is to serve similar range of functions but on a much larger scale, with sufficient capacity to cater for the regions requirements in the long term.

The proposal includes the reclamation of approx 27ha of land for landside facilities together with dredging over an area of approx 46.5ha for approach channels, turning areas and berthage. The proposal also includes upgrading of roads and services and the provision of a railway line from the existing railway network to the new port facility. Landside facilities will include commercial quays, yardage and storage areas, cruise liner facilities, port related buildings, a nautical centre and boatyard, marina, fishing pier and yard, together with ancillary landscaping, amenity areas and public promenades. The development will include the relocation of existing freight and related activities to the new port, thus freeing up lands adjoining the existing harbour for urban regeneration, due to their City Centre location.

Transport infrastructure is of fundamental importance for the smooth operation of the EU internal market, for the movement of people and goods and for the economic and social cohesion of the European Union. This is recognised in the *"Trans-European Transport Network"* (TEN-T), which is a key element in the Lisbon Strategy for competitiveness and employment and is also important to the attainment of the objectives of the Europe 2020 Strategy.

European transport policy also encourages a modal shift from road freight transport to rail, inland waterway and short sea shipping. In this regard, there have been a number of European programmes to encourage intermodal transport and, in particular, facilitate maritime transportation of goods within the European Union. Such programmes include the PACT and Marco Polo programmes and their replacements. In addition, the EU White Paper "European transport policy for 2010: time to decide" (2001) includes measures aimed at developing a European transport system capable of shifting the balance between modes of transport, revitalising the railways, promoting transport by sea and inland waterways and controlling the growth in air transport.

3.1 GALWAY HARBOUR EXTENSION - OBJECTIVES

The objectives for GHE are derived from both the National Ports Policy (NPP) and Galway Harbour Company's business case. In designating Galway as a port of regional significance, the NPP has identified Galway harbour's role as a commercial port within the national context. The business case identifies commodities currently using Galway port, together with potential commodities and opportunities, in addition to projections for future growth.

The primary objective of Galway Harbour Extension (GHE) is to provide new port facilities, building on existing port infrastructure, to upgrade and replace existing inadequate facilities, in line with National Policy which is aimed at achieving balanced regional development and supporting the strategic role of Galway as the Gateway City within the west region. Galway City has an extensive maritime history and tradition and has served as the primary maritime access, between the west region and continental Europe since the 12th Century. The existing port serves a number of different functions/sectors. The predominant activity is freight, in particular bulk freight. The existing port also serves as a fishing port, international cruise tourism and a marina as well as servicing offshore exploration and offshore renewable energy generation. The proposed harbour extension is required so that Galway Harbour Company can continue to fulfill these roles as the principle maritime gateway to the west region.

Galway City is the primary population centre within the region, the designated Gateway City and strategic regional transport hub for both road and rail transport. Galway Harbour has significant established port related infrastructure including dedicated storage and distribution facilities for a range of bulk commodities.

The primary requirement for the extension arises from the severe constraints within the existing harbour. The objectives for the extension therefore is to provide a facility which will serve existing and future long term needs over a minimum 30-year period and will include the following:

- Sufficient quay length to accommodate freight, cruise and offshore servicing and operational requirements
- Sufficient draft for all tide access to each berth based on proposed use
- Sufficient capacity to accommodate 20,000 tonnes freight capacity vessel size
- Sufficient land to support the necessary land based facilities for a sustainable port
- Addressing existing SEVESO issues through the construction of petroleum and bitumen terminals and transfer pipelines to the existing tank farms, to replace current unloading operations within the existing harbour/city centre area

Following the pre-application consultation process for potential strategic infrastructure projects with An Bord Pleanála, the Board have determined that GHE constitutes strategic infrastructure and is of strategic importance (ABP Ref: 61 PC0012). This extract sets out the criteria to be satisfied under Section 37A of the Act and the Boards conclusion.

"Conditions required to be satisfied under section 37A to warrant application to be made to Board under section 37E: *Section 37A requires the Board to also confirm, following consultations under section 37B, that the proposed development would meet one or more of the following criteria**:***

(a) the development would be of strategic economic or social importance to the State or to the Region in which it would be situate,
(b) the development would contribute substantially to the fulfillment of any of the objectives in the National Spatial Strategy or in any regional planning guidelines in force in respect of the area or areas in which it would be situate,
(c) the development would have a significant effect on the area of more than one planning authority".

4.14 Conclusion: *Having regard to all the above we conclude that the proposed development (other than general warehousing) would meet the definition of Strategic Infrastructure contained within the Seventh Schedule (Infrastructure Developments for the purposes of sections 37A and 37B) Transport Infrastructure Section 2 under the clauses relating to "A harbour or port installation". Further it would constitute development of strategic economic importance to the State and region contributing to objectives contained within the National Spatial Strategy and Regional Planning Guidelines for the West Region and would thus fall within Sections 37A (2) (a) and (b). The proposed development should therefore be regarded as strategic infrastructure development for which an application for permission should be made to the Board under Section 37E of the Planning and Development Acts 2000 - 2006."*

3.2 GALWAY HARBOUR EXTENSION – DEVELOPMENT DESCRIPTION

The Galway Harbour Extension (GHE) development involves the extension seawards, through reclamation, of the existing harbour enterprise park to provide new quays, yards and storage areas together with a marina. The GHE involves the following elements:

- 600m of commercial quays
- Yardage and storage areas
- Facilities for cruise liner passengers
- Port related buildings
- Fishing pier and yard
- Nautical centre boatyard
- 216 berth marina
- Wave protection walls
- Twin rail tracks connected to existing railway network
- Oil and bitumen unloading and transfer pipelines
- Helicopter pad
- Landscaping, amenity areas and public promenades

The GHE development will provide sufficient draft for all tide access for freight vessels of up to 20,000 tonnes. It will build on existing landside port related infrastructure including petroleum and bitumen tank farms, yards, storage buildings, marine engineering facilities etc. The development will result in the transfer of freight operations from the existing harbour, thus freeing up harbour lands for urban regeneration.

The new port will require the reclamation of approx 27ha of land and dredging over a further area of approx 46.5ha for approach channels, turning areas and berthage.

3.2.1 Existing Infrastructure

The proposal does not involve starting from a "greenfield" position in terms of meeting the requirement of the brief as laid down. It involves using existing infrastructure in the form of the existing inner harbour/port together with the harbour enterprise park. The existing harbour will continue to serve some fishing interests and a marina as well as servicing the off shore islands. The existing harbour enterprise park, which comprises a total area of approx 16ha, accommodates state of the art petroleum and bitumen terminals, a marine engineering facility, a fish processing plant, in addition to both enclosed and open storage. The objective therefore is to build on the existing infrastructure by providing a facility capable of accommodating viable vessel size. Without utilising and building on this existing infrastructure, the footprint, cost and sustainability of a similar facility to that proposed, starting on a "greenfield" site would be unsustainable.

3.3 POLICY CONTEXT

The policy context for Galway Harbour Extension is set out in Chapter 2 of the EIS. It identifies the key planning policy documents and identifies how the proposed development supports the policies and objectives in these strategies and plans. The policy review in that includes European, National, Regional and local policies and objectives that are relevant both to ports and port related business, in addition to Galway City and Galway Harbour specifically.

The National Ports Policy 2013 is the most relevant National Policy Document in the context of GHE and in particular in the context of the assessment of alternatives. The NPP categorises ports, on the basis of their current size/capacity into Ports of National Significance (Tiers 1 &2) and Ports of Regional Significance. The Ports of National Significance are Dublin, Cork, Shannon/Foynes, Waterford and Rosslare. Galway is one of 15 No. ports designated in the NPP as a Regional Port. The policy states that Regional Ports "handle commercial traffic and function as important facilitators of trade for the regional and local hinterland". It further notes that 5 No. of the Regional Ports are in State control, including Galway Harbour.

In terms of regional ports, the NPP identifies important but different "roles for the 5 State owned ports of regional significance" it recognises the importance of these ports in serving the hinterlands and in supporting balanced regional development. It further notes that these ports could play a more significant role in supporting national economic development in certain specialised trades (e.g. oil/petroleum import and storage/offshore energy servicing) as well as maritime tourism. The NPP also supports the development of the cruise tourism sector.

Galway Harbour is identified in the NPP as an important strategic regional hub for petroleum importation, storage and distribution (Section 2.7.3). The NPP also identifies Galway Harbour as having important potential in terms of servicing the Ocean Energy Sector by endorsing findings of the IMDO Report (Section 4.2). It further identifies the benefits of reintegration and rejuvenation between the port and city using the Volvo Ocean Race as a demonstration of success in this regard (section 4.5).

3.4 ALTERNATIVES – METHODOLOGY

The assessment of alternatives examines a range of alternative ways of implementing the project that, where possible, minimises or avoids adverse environmental impacts. The objective in this regard is to determine whether the project, either alone or in combination with other projects or plans is the optimum method of meeting the project objectives, while at the same time achieving an acceptable environmental impact.

Possible alternative solutions could include the following:

- Locations
- Scale or size
- Means of meeting objectives (e.g. demand management)
- Methods of construction
- Operational methods
- Decommissioning methods at the end of the projects life
- Scheduling & timescale proposals (e.g. Seasonal working)

Demand management is not relevant in the context of the GHE project which is designed to cater for economically international trade serving the region.

A number of the further possible alternative solutions identified above, such as methods of construction; operational methods; decommissioning methods at the end of the project life and scheduling and timescale proposals do not in themselves meet the project objectives. However

these alternatives have formed part of the assessment of alternatives in the form of mitigation measures as part of the proposed design/location.

The assessment of Alternative Solutions must include an assessment of the 'do nothing' alternative.

A crucial step in assessing whether alternative solutions exist is the identification of the objectives of the project concerned. From this starting point, it is possible to examine a range of alternative ways of achieving the objectives of the project and these alternatives can then be assessed against their likely impacts on the conservation objectives of the Natura 2000 site.

3.5 ALTERNATIVE SOLUTIONS

The GHE site meets Galway Harbour Company's objectives and is in line with national policies and is a practicable and commercially viable proposal. However compliance with the Habitats Directive, in addition to European and Irish environmental assessment regulations requires identification and assessment of potential alternative solutions to GHE as currently proposed.

Alternatives assessed include the "Do Nothing" scenario; improvements to the inner harbour; alternative scales/designs at the proposed location in Renmore; alternative/sites locations in the inner bay and alternative established ports beyond Galway Bay. The following alternatives were assessed:

- Do nothing.
- Improvements to the existing Inner Harbour.
- Alternative scales/designs at proposed/ location.
- Alternative locations in the inner Galway Bay (i.e. Tawin and Mutton Island).
- Alternative ports beyond Galway Bay (i.e. Ports of National Significance as per NPP – Dublin, Cork, Shannon Foynes, Rosslare & Waterford).
- Alternatives Abroad.

The following sections outline the alternatives assessed in the order set out above.

3.5.1 "Do Nothing" Scenario

The existing operation of Galway Harbour is outlined at Section 2.2 and this includes details of the primary imports and export and the key customers for the port. The existing constrained nature of the port is also detailed at Section 2.2 and it has been demonstrated that the port cannot handle vessels of the size that modern requirements demand. The 'do-nothing' scenario is, by definition, based on the existing port situation prevailing, with no significant improvement to port facilities or capacity. This would not address the very significant tidal and vessel capacity constraints that currently affect the port and Galway would continue to be disadvantaged in this regard. This threatens the longer term viability of the port, as customers decide to switch to other ports that can handle larger vessels and are not subject to tidal restrictions. In effect, this will lead to the decline of the harbour with associated implications for the region.

In the absence of a vibrant and viable harbour in Galway to serve the needs of the city and region, goods will require to be imported and exported via other ports in Ireland. This could result in increased transportation costs to the West and is not in accordance with sustainable transport considerations. In addition, Galway would lose that connection with the sea and its maritime tradition would thus decline.

In summary, the 'do nothing' scenario would result in:

- Continued tidal constraints
- Continued handling/berthage constraints
- No freight rail link
- Continued SEVESO issues
- Decline of port
- Economic decline
- Loss of maritime tradition
- Unrealised maritime tourism potential

3.5.2 Improvements to the existing Inner Harbour

The existing constraints at the inner harbour location render this scenario effectively not an option. In particular, the tidal and handling/berthage constraints would persist, as would the SEVESO issues. The future outlook would therefore be similar to the 'do-nothing' scenario.

3.5.3 Alternative scales/designs

The proposed GHE evolved following consideration of a number of alternative scales/designs over a seven year period. In total 8 No. alternative layouts were prepared and assessed under a range of criteria to meet project objectives. Evolution of design progressed during the course of public consultation and planning authority interaction. The 8 No. alternative layouts can be broadly grouped under 3 No. Progressions in Design. The following sections set out a brief description of each design progression followed by a summary table (Table 3.5.1) and a comparison in terms of impacts in Table 3.5.2. A layout plan for each option is contained in Appendix 3.1.

3.5.3.1 Progressions in Design

The layout evolved over the course of 3 No. Progressions in Design:-

- Design Progression No. 1: Original brief and Initial Study that positioned the Cruise Liner Berth at the Southern extremity, resulting in 2 No. layout progressions (Layout Design No. 1 & 2).
- Design Progression No. 2: Class 1 Oil Storage located at the Southern extremity and Cruise liner berth relocated to western side and, resulting in 3 No. layout progressions (Layout Design Nos. 3, 4 & 5).
- Design Progression No. 3: Class 1 Oil Storage at southern extremity removed and cruise liner relocated to share the Commercial Port Quay area, resulting in 3 No. layout progressions and the final layout design (Layout Design Nos. 6, 7 & 8).

In all 8 differing layouts were considered, grouped under the above 3 No. Design Progressions, all of which sought to address the principal issues of:-

- Resolving the shipping constraints at the existing Harbour.
- Allowing the Harbour Extension to access more suitable and deeper water south of the Galway Harbour Enterprise Park.
- Facilitating the relocation of the existing harbour facilities as envisaged in the Galway City Development Plans 2005-2011 and 2011-2016.

3.5.3.2 Design Progression No. 1

Original brief and Initial Study that positioned the Cruise Liner Berth at the Southern extremity

Layout No. 1

Layout No. 1 was based on the Client's initial Brief and was used to commence contributor interactions and studies of specific requirements. The layout comprised of:-

- Rail Freight Yards and Rail Link
- Public Amenity access on each side of the New Port lands
- Amenity and Fishing Berths to the Eastern, leeward side of New Port lands
- Cruise vessel facility at South of Commercial Quays.
- 107.14 ha of Seabed Impact
- 48.2 ha of land take
- 40 ha of new back up lands (28.05 ha Commercial Yards)
- 1,326m Seaward projection
- 2,140m of Deepwater Quays

Layout Design No. 2
Layout No. 2 detailed the land use proposals based on the client's requirements. . The layout also showed:-

1. Enhanced Marina capacity requirement
2. Enhanced fishing facility provision
3. Initial land use proposals detailing:-
    - Rail Link
    - Amenity access on both sides
    - Cruise vessel berth at South of facility
    - Turning circles requirements

The Layout comprised:-

- 48.33 ha land take (including revetments, breakwaters, back up lands and quays)
- 40 ha of new back up lands (28.05 ha Commercial Yards)
- 1,318m Seaward projection
- 2,140m of Deepwater Quays
- 107.14 ha of Seabed Impact

The Interaction with contributors on Layout No. 2 resulted in continued design progression.

3.5.3.3 Design Progression No. 2

This design was progressed to facilitate the provision of a Class 1 Oil Storage facility located at the Southern extremity. Seveso requirements resulted in the relocation of the Cruise liner berth to the western side to satisfy exclusion zone requirements.

Layout Design No. 3
In order to satisfy Seveso, road, visuals, amenity and ecology requirements, the layout was revised accordingly:-

1. Future Oil Storage for Class 1 product moved to Southern extremity.
2. Cruise Liner brought closer to the City, South of the marina.
3. Marina moved to City side and closer to old Port and City.
4. Oil Jetty on South Western Commercial Quay, with additional oil storage area to south.
5. Amenity usage on both sides enhanced with Nautical Centre for junior sailors remaining on Eastern Renmore side.
6. Concentration of vehicular access to Port lands through central road subject to Port security, rail freight yards between rail lines and quays.
7. Concentration of Commercial Port to Eastern side with amenity and old Port access to Western side.

The Layout then comprised:-

- 47.19 ha of Land take (including revetments, breakwaters, back up lands and quays)
- 38.1 ha of New Back up Land (25.05 ha Commercial Yards)
- 1,370m Seaward Projection
- 1,120m of Deepwater Commercial Quays & 585m of Cruise liner Quay
- 106.29 ha of Seabed Impact

Layout Design No. 4
Layout Design No. 4 was prepared following further consultation with contributors on visuals, amenity, access, business case and the scale of development.

This resulted in:-

1. The seaward extent of land and total length of Quays to be reduced.
2. Scale of Class 1 Oil Storage reduced at Southern extremity.
3. Dedicated Cruise / Marina facility moved to the Western side.
4. Amenity area linking between Marina and Nautical Centre formed to enhance public access around the development.
5. Amenity area on Eastern side extended back to link to open space provided as part of G.H.E.P. and providing link to Lough Atalia park land.
6. Access to Port security lands exclusively via central access road.
7. Rail Link along back of Commercial quay with back up land to rear of the rail lines.

This reduced the overall development to:-

- 33.8 ha of Land Take (including revetments, breakwaters, back up lands and quays)
- 27.34 ha of New Back up Land (18.9 ha Commercial Yards)
- 1,090 m of Seaward Projection
- 1,080 m of Deepwater Commercial Quays & 400m of Cruise liner Quay
- 103.51 ha of Seabed Impact

Layout Design No. 5
The layout was revised following feedback from the results of preliminary echo soundings of soil profiles, hydrodynamic, wave and sedimentology modelling Layout Design No. 5 resulted in:-

1. A further reduction in seaward projection.
2. A more compact pattern.
3. A more geographically sheltered facility.
4. A more self sheltered facility.

The layout then comprised of the following:-

- 32.8 ha of Land Take (including revetments, breakwaters, back up lands and quays)
- 26.63 ha of New Back up Land (18.33 ha Commercial Yards)
- 1,000 m of Seaward Projection
- 1,060 ha of Deepwater Commercial Quays & 400m of Cruise Liner Quay
- 101.01 ha of Seabed Impact

3.5.3.4 Design Progression No. 3

Following further interaction with contributors on Seveso issues, the Class 1 Oil Storage at southern extremity was removed. As exclusion zones around the oil storage facility no longer applied, the cruise liner berth was relocated to share the Commercial Port Quay area

Layout Design No. 6
Seveso Issues were resolved and as a result:-

1. Class 1 Oil Storage at Pier head removed, on basis that Class 1 capacity will be met within existing oil facility and additional Class 2 and Class 3 on the site to the South of the existing Oil Terminal, when required.
2. Cruise Liner relocated to Commercial Port resulting in a significant reduction in dredging and ecological impacts

3. Reduced environmental impact.
4. Multifunctional use of reduced extent of Quays.
5. Business Case / Construction Cost Balance continued to be pursued, with further Ecological and Hydrodynamic Studies to continue to minimise the impact on the environment and the cSAC, SPA and pNHA site designations.

This reduced the development to:-

- 29.42 ha of Land Take (including revetments, breakwaters, back up lands and quays)
- 22.35 ha of New Back up Land (14.2 ha Commercial Yards)
- 1,040 m of Seaward Projection
- 660 m of Deepwater Quays (260m Oil and Bitumen Quay, 400m Multipurpose Quay)
- 78.62 ha of Seabed Impact

Layout Design No. 7
The layout was adjusted to achieve a Balance of Cut and Fill.

The extent of back up lands was reduced, to marshalling rather than storage yards.

Yards and future warehousing, tanks etc. to be reserved for product throughput as short stay storage or transit yards.

This resulted in:

1. Further reduction in seaward projection.
2. Reduction in sea bed area of impact.
3. Balance of cut and fill.
4. Elimination of non-strategic buildings from the Proposal to align with S.I.D. requirements.
5. Significant concentration on construction methods, phasing and costs.
6. Significant further Ecological Studies.
7. Public Consultation.
8. This layout became the basis for the An Bord Pleanála Scoping process.

This layout comprised of:-
- 26.07 ha of Land Take (including revetments, breakwaters, back up lands and quays)
- 21.67 ha of New Back up Land (12.7 ha Commercial Yards)
- 917 m of Seaward Projection
- 660 m of Deepwater Quays (260m Oil and Bitumen Quay, 400m Multipurpose Quay)
- 75.29 ha of Seabed Impact

Layout Design No. 8
The final layout was achieved following physical ground investigations, hydrodynamic, wave and sedimentology modelling.

This resulted in:
1. Southern breakwater extended on foot of final Wave Study Report.
2. Fishing Pier moved seaward to reduce dredging and area of impact on seabed. Fishing Pier / Yard facility enhanced.
3. Dredging Working Area added.
4. Least area of impact on sea bed.
5. Confirmed construction methods.
6. Confirmed mitigation measures.
7. Confirmed operations and safety details.
8. Confirmed navigational details.

9. Planning boundary extended to city and existing G.H.E.P. roads and to CIE rail embankment.

The layout is now based on minimum cost, minimum area, minimum impact while giving maximum relief of existing harbour constraints and providing a Port for the region for the design life and beyond

The final layout design comprises:-

- 26.93 ha of Land Take (including revetments, breakwaters, back up lands and quays)
- 23.89 ha of New Back up Land (11.58 ha Commercial Yards)
- 938 m of seaward Projection
- 660 m of Deepwater Quays (260m Oil and Bitumen Quay, 400m Multipurpose Quay)
- 78.71 ha of Seabed Impact (Including Working Area)

3.5.3.5 Summary of Final Layout Design

The final selected design arising from the process has provided for:-

- A concise footprint.
- A facility that fits neatly between Mutton Island and Hare Island.
- Natural and efficient shelter for each of the required elements.
- A reduced impact on the hydrodynamics of the Inner Bay.
- An economic fit onto the sea bed soil and sea bed rock contours, thus allowing for:-
    - A balance of cut and fill of materials
    - A reduced ecological impact and
    - An efficient construction proposal.

The layout satisfies the criteria required by client and contributors. The progression in design was concluded in July 2011 and a decision made to proceed with the planning application on that basis.

Summary of Scheme Changes (New Lands) – Summary of Design Progressions									
	1	2	3	4	5	6	7	8	9
	Land Take (New Land) (ha)* [Incl. Revetments]	Commercial Quay (ha)	Breakwater & Revetment (ha)	New Back Up Lands (ha) [For Yards / Landscaping]	Old Dock Channel Side Projection (m)	Seaward Projection (m)	Deepwater Quays (m)	Total Seabed Impact (ha) [Without working area]	Seabed Less Existing Dredged Channel Impact (ha)
Design Progression No. 1									
Layout No. 1	48.2	8.2	-	40	1326	1326	2190	107.14	95.71
Layout No. 2	48.33	8.33	-	40	1318	1318	2140	107.14	95.71
Design Progression No. 2									
Layout No. 3	47.19	5.23	3.86	38.1	1370	1370	1705	106.29	94.86
Layout No. 4	33.8	4.22	2.24	27.34	1035	1090	1480	103.51	92.08
Layout No. 5	32.8	4.09	2.08	26.63	946	1000	1460	101.01	89.58
Design Progression No. 3									
Layout No. 6	29.42	2.49	4.58	22.35	865	1040	660	78.62	67.19
Layout No. 7	26.07	1.94	2.46	21.67	670	917	660	75.29	63.86
Layout No. 8 (Final Layout)	26.93	1.72	3.04	22.17	670	938	660	68.11 [73.41 Incl. Working Area]	61.98

Table 3.5.1 - Summary of Design Progressions

See Appendix 3.1 for Layouts 1 – 8.

3.5.3.6 Summary of the elements of the Proposed Development –

The previous table at column 8 shows that the total seabed impact for land, quays, revetment, and dredge areas is 73.41 ha, the dredge working area is 5.3 ha and the area of GHEP to be re-worked is 4.18 ha giving a total of 82.89 ha as per column 3 below.

Summary of Proposed Development (New Lands and Existing GHEP)											
1	2	3	4	5	6	7	8	9	10	11	12
Total Area of Planning Application [Incl. Working Areas]	Area of Inner Port and City Road Lands	Proposed Port Development (ha)** [Incl. working area 5.3 ha]	Existing GHEP Lands (ha)	Total Area of New Land (ha)	Total Commercial Yards (ha)	Total Marina Village / Amenity / Open Space / Landscaping (ha)	Total Roads & Rail (ha)	Total Commercial Quays (ha)	Breakwaters & Revetments (ha)	Dredged Area (ha) [Excl. working area]	Working Area (ha)
85.39	2.5	82.89	4.18	23.89	11.75	8.43	6.17	1.72	3.04	46.48	5.3

Table 3.5.2 - Summary of Proposed Development (New Lands & Existing GHEP)

** Includes New Land, Redeveloped Existing GHEP Lands, Dredged Area, Working Area, Breakwaters and Revetments

1 = Sum of (2 + 3)
3 = Sum of (4+5+10+11+12)
Sum of 4+5 = Sum of (6+7+8+9)

3.6 ALTERNATIVE LOCATIONS IN INNER GALWAY BAY

Tawin and Mutton Island were assessed in terms of their potential suitability as alternative sites to the proposed Renmore location. Neither alternative location has any harbour infrastructure at present and would effectively constitute the development of a new port on a Greenfield site together with all of the associated facilities.

In the case of Mutton Island a number of alternative schemes were considered. These can broadly be subdivided into two categories. The first involves the development of a new harbour in conjunction with existing landside facilities at GHEP, while the second involves a total replacement of these facilities and therefore effectively involves the development of a new harbour in its entirety together with replacement of all landside facilities.

The following section provides a brief description of both the Tawin and Mutton Island alternatives.

3.6.1 Tawin

Tawin Island is located on the southern shore of Galway Bay almost due south of Mutton Island. Tawin has deep water just off the land and hence has potential from the perspective of quay construction. By road it is remote from the nearest main road at Oranmore, and is also remote from rail and other services.

The facilities required by the qualifying criteria are as follows:

- 660m of quay capable of handling vessels of max 8m draft float in all in tides
- 40ha of back up lands to cater for harbour facilities which would require to be relocated
- Have existing landside infrastructure
- Rail access and national road access

Alternative analysis of the Tawin Island location is categorised under the following headings:

- Road and Rail Infrastructure
- Viability of Replacement of Existing Harbour Infrastructure
- Aesthetic Issues
- Tourism, Amenity and Community Benefits
- Availability of Local Services
- Environmental Issues
- Ease of Accumulation of Lands
- Natural Attributes

Road & Rail Infrastructure

Tawin Island is an Island connected to the mainland by a secondary road. The island is south of Galway City across Galway Bay. The exact location of Tawin Island can be seen in Fig. 3.6.1.

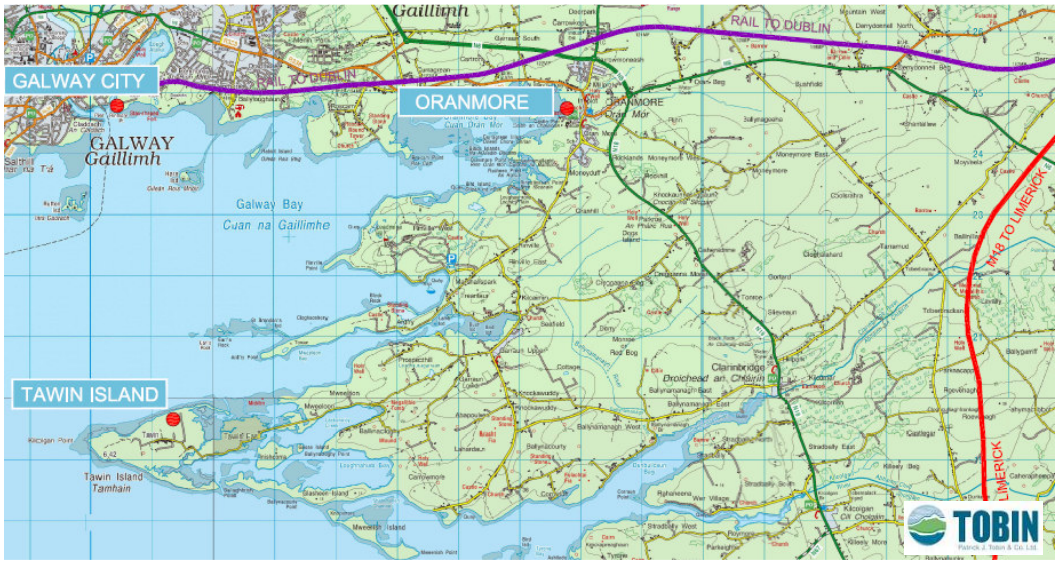

Figure 3.6.1 - Tawin Island location and road infrastructure

As can be seen from the map Tawin Island is in an isolated location southwest of Oranmore. The green line in Fig 3.6.1 is the current N18 national primary route from Galway to Limerick. The red line shown is the new route which will run from Rathmorrisey directly to Limerick consisting entirely of dual carriageway. Tawin Island is 10.2km from the current national primary route and 15.2km from the proposed new national primary route.

The road connecting Tawin Island to these main roads is a single lane local road with no hard shoulder. It is therefore unsuitable for port traffic. If Tawin Island were to be utilised as Galway's primary port, the 10.2km road from Tawin Island to the N17 would have to be substantially upgraded. There is however an associated problem with this road development. Linear development has occurred along the local route from Tawin Island to the N18 and any proposal to develop the road would impact approximately 110 residents.

In summation:

- Tawin Island is in an isolated location, 10.2km (by road) from the nearest existing primary route and 15.2km (by road) from the new proposed route for the N17.
- The Island is served by a single lane local road with no hard shoulder which is insufficient to the harbour facilities required.
- Substantial high valued linear development has arisen along the local route serving Tawin Island. This is likely to represent a hurdle in the way of road development.
- It is unlikely that planning permission would be obtained to construct a road that would link Tawin to a national primary route to service a port capable of serving the region.
- Tawin Island is not a suitable location for a port rail link. The possible port location at Tawin Island is 12.2 km from the nearest rail line and is likely to require the bridging four third class roads and at least two national primary routes. Land would also have to be purchased for the entire length of the rail link from Tawin Island to the Galway-Dublin line.

Availability of Local Services

Tawin Island is not served by an existing water supply scheme. Clarinbridge or Maree are the closest trunk mains in the area. These mains are supplied by the Tuam Regional Scheme. As discussed above there is ample capacity in the water scheme to facilitate the development. However locating the development at Tawin Island would necessitate an extension to the existing trunk line which would mean the laying of up to 7km of rising main along existing roadways.

There are no wastewater facilities in the Tawin Island area. A localised treatment plant, adjacent to cSAC / SPA, would have to be constructed at the harbour site to deal with wastewater. This would incur costs to construct and have an associated operating cost, discharge licence and discharge to designated site issues.

Tawin Island is isolated from emergency services. The closest emergency services to Tawin Island are in Galway city. This means travel distances to Tawin Island of approx 40minutes (21.6km) from Galway University Hospital and approx 39 minutes (20.1km) from the nearest fire station also located in Galway City.

Tawin Island's existing services are not adequate to service a port for the region.

Environmental Issues

The Tawin site is in land designated cSAC and SPA. The Tawin Island site would require either deepwater pier construction or deepwater berth dredging adjacent to the intertidal zone.

Because Tawin was not considered to be a viable alternative due to lack of road, rail, water supply, sewage disposal and power supply, only preliminary detailed design was undertaken. This would indicate a marine footprint disturbance of some 38.9 ha to provide quays, berths, turning circle and channel

Marine and adjacent terrestrial flora and fauna would be affected with a 40ha land development requirement. The proposed site is currently remote agricultural land and lands of significant ecological merit. The surrounding area is sparsely populated. Therefore the proposed development may have a substantial effect on the tranquillity and remoteness of those lands and on the noise and air standards that the locality now experiences.

Road and rail developments would further impact on sensitive lands.

Viability

Tawin island is not a suitable location for road or rail interconnectivity. Considerable investment would have to be made in order for the Tawin Island location to be able to cater for the traffic generated by a modern deepwater harbour.

Lands would seem to be available for development, adjacent thus minimising the need for land reclamation and the costs associated with this work.

The Tawin Island site would require either deepwater pier construction if piers are extended into the deeper water or berth dredging / turning circle in an intertidal zone if kept closer to the shore which would result in an increase of the dredge area and rock volume. Therefore the option which would entail the greater extent of deepwater pier construction was the one considered.

If the Galway Harbour Company were to relocate to Tawin Island, the existing customers would be forced into very significant outlays to re-establish on Tawin Island. Relocation would be a significant negative issue at this location.

Upon examination of Tawin Island's existing services it is clear that the area is not adequately equipped to cater for the port required. A large investment would have to be made to provide suitable water supply and wastewater services making the viability of the location option very difficult.

Replacement of Existing Harbour Infrastructure

If the proposed new harbour is located in Tawin, there would be significant outlays associated with the relocation of the existing Galway Harbour infrastructure from the existing Port area and from the Galway Harbour Enterprise Park (GHEP).

Ease of Accumulation of Lands

As shown on the map below there is sufficient land available for harbour backup lands at Tawin Island. Figure 3.6.2 shows the discovery map of the Tawin Island.

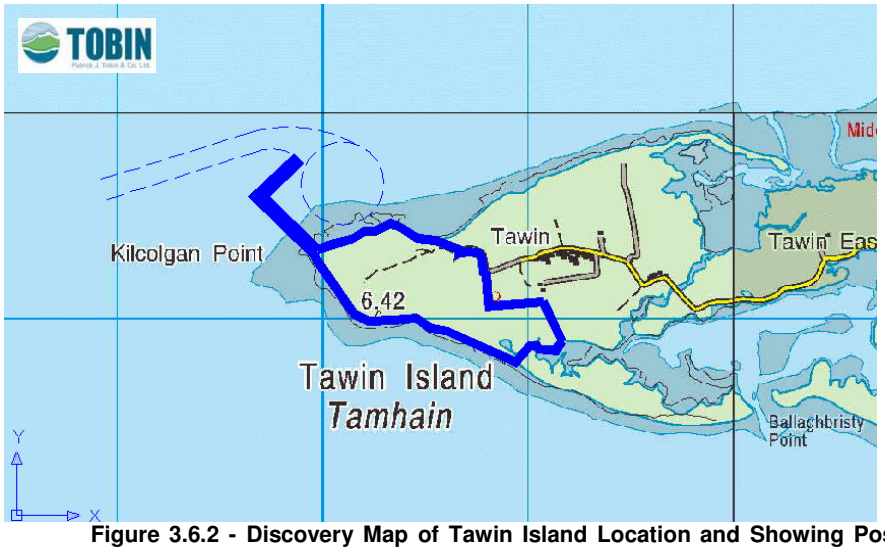

Figure 3.6.2 - Discovery Map of Tawin Island Location and Showing Possible Harbour backup Lands

Tawin Island is very sparsely populated and there is ample room for harbour backup lands. The land area outlined above meets the requirement of 40ha.

Aesthetic Issues

The Tawin Island site is an area with no large scale developments. A large industrial port would present a totally new aesthetic departure to the area. Tawin Island is a rural area of relatively unspoilt landscape. The proposed development will have an impact on this landscape.

Tourism, Amenity and Community Benefits

Tawin Island is in an isolated rural location 21km from Galway city centre. The island has very little in the way of developed leisure and amenity facilities. Tawin Island would be unsuitable as a cruise liner stopover and as an area of marina development. The region would miss out on any associated tourism revenue if the proposed port were constructed at this location, as this location will not attract cruise liner business.

In terms of benefit derived from the construction of parklands and promenades, Tawin is a lowly populated, remote area which has an abundance of natural open space. Therefore, parklands and promenades would be of little community benefit.

Natural Attributes

The Tawin Island site has the benefit of adjacent deepwater. The proposed site is not sheltered from the prevailing sea conditions so measures to improve shelter would have to be implemented. High sea walls would be required. Tawin Island provides ample room for harbour back up lands.

Summary

Tawin Island:

- Has deep water adjacent and land available
- Would require very significant upgrade works on roads with significant existing residential development or a new road access system
- Remote from rail in a rural area
- Would not suit existing customer infrastructure
- Significant visual impact, very exposed landscape
- Of little tourist, amenity or community benefit
- Construction of piers and berths reasonable due to reduced dredging but the viability of providing new services is very poor
- A most exposed location to westerly and south westerly winds and seas, requiring greater sea wall defenses
- Located in cSAC, SPA upon which it would have significant impacts with less strategic benefits arising to the region due to remote location

3.6.2 Mutton Island

Mutton Island is located about a kilometre offshore to the west of the mouth of the River Corrib. As it is located close to Galway city centre, this location has many of the same advantages as the new Galway Harbour location and a shorter distance from land to deep water.

However, as Mutton Island is on the west side of the river, the majority of harbour traffic generated from construction and operation phases of the development would need to pass through the city centre adding to existing traffic congestion in the absence of an alternative road link. A narrow causeway links the mainland to the island and this is subject to periodic sea overflow.

The new harbour development would be located further out to sea to South and East of the existing sewage treatment works to access the appropriate water depth. In addition to the development of the new harbour, the causeway would have to be widened to allow for the traffic to move safely. It would also have to be raised to avoid flooding when the tides and seas are high. Given its distance from the existing oil tank farm, there would be the need to create more significant pumping systems and networks for transferring the petroleum and bitumen products to the storage tanks.

This study required that the relative merits of Mutton Island be examined and then be compared with the Renmore proposal a) on physical merits, and, when it proved to be the best of the alternatives to Renmore, b) that it should be studied in detail on its relative ecological merits versus Renmore. We note that all three sites Renmore, Tawin Island and Mutton Island have the same Natura designation constraints.

The Mutton Island location is categorised under the same headings below as was undertaken for the Tawin Island location.

Road & Rail Infrastructure

The present access to Mutton Island is via the Martin Connolly causeway which was constructed as a single traffic lane access to the treatment plant.

It was set at a level to allow overtopping by high seas to curtail visual impact and to curtail accretion on the Eastern side so the intertidal lands in that vicinity would be changed as little as possible by the construction.

Road access is therefore possible but very poor for Harbour purposes. The enhancement of road access would require significant new road construction, which would either impact significantly on the town, the Claddagh and the causeway or warrant an alternative seaward road access which would cause significant other impacts and viability issues.

Rail access is presently not available. Rail access could be provided largely in tandem with whatever road access solution could be found but would be difficult, as the line presently ends at Ceannt Station and would either require to be extended from there or from a siding off the rail line as it approaches Ceannt Station. Road and Rail access are therefore considerable service deficits.

Availability of Local Services

The services provided to Mutton Island at present are provided solely for its current uses. Additional adequate services would require to be provided with the existing foul sewer being the only one which could be deemed to be convenient.

Environmental Issues

The waters off the Mutton Island site are in cSAC, SPA and therefore require ecological comparison with any viable alternative. This issue is addressed in Section 3.6.3 below.

Viability

As deeper water is close to hand less dredging would apply. Construction of piers, breakwaters and causeway would be more cost effective. However exposure would require higher and stronger sea walls, and rising of road access.

Replacement of Existing Harbour Infrastructure

Mutton Island is the closest possible alternative site to the existing harbour lands / GHEP. Mutton Island could be linked to the existing GHEP infrastructure possibly partly along whichever road and rail access routes are chosen which may result in a part Renmore / part Mutton Island solution. Significant outlays would be required to link the Infrastructure. Existing GHEP industries which wish to expand their existing services and infrastructure would require the room for expansion to be adjacent to their existing facilities hence the likely further preference for a part Renmore / part Mutton Island solution.

Ease of accumulation of lands

The Mutton Island location requires greater land reclamation in a cSAC designated intertidal area than the Renmore location.

Aesthetic Issues

Mutton Island presently has the Lighthouse which is deemed to be part of Galway City's heritage. The addition of a port development to the island would increase the visual impact and would be considerably more prominent and controversial than the same elements located closer to the land at Renmore where it would be less prominent and where lesser sea defense walls would be required being in the lee of both Mutton and Hare Islands.

Tourism, Amenity and Community Benefits

Cruise liner operators are more likely to visit locations which provide ease of access to the city or town adjacent. Mutton Island provides such ease of access, albeit not as easily as the Renmore location.

Marina facilities and amenities at Mutton Island are deemed to be of a more remote and less appealing location than those of a location closer to the city centre such as the Renmore location. Mutton Island does not offer the sheltered, sand bedded option for Marine amenities afforded by the Renmore Location.

Natural Attributes

Mutton Island has the benefit of adjacent deep water and proximity to the existing port and the city. It therefore warrants this scrutiny as a possible alternative.

Summary

Mutton Island:

- Has deep water adjacent, no land available, adjacent to existing port and city
- Will require very significant road upgrade works which will have considerable environmental and amenity impacts
- Remote from rail in urban setting
- Would not suit existing customer infrastructure
- Significant visual impact, very exposed Island landscape
- Of reduced tourist amenity and community gain
- Exposed to southwesterly winds and seas
- Very poor viability for the provision of services.
- Located in cSAC, SPA without maximum strategic benefits

3.6.3 Ecological Assessment of Mutton Island Options versus the Renmore Option proposed

When Mutton Island and Tawin Island were compared, Mutton Island was deemed the preferable of those alternatives. Hence detailed study of Mutton Island was undertaken, on an ecological, hydrodynamic, wave deflection and construction basis, to see if a Mutton Island proposal could be found which would have a lesser impact than the Renmore proposal.

Alternatives 1 -4: Deep Water Berths at Mutton Island / Backup Land at Renmore

The initial concept was to move only the deep water berths to Mutton Island and add as much of the backup land required for storage at Renmore. Thus only the marshaling yards to allow export / import would be located at Mutton Island. This concept became alternatives 1 to 4

Alternatives 5 - 8: Deep Water Berths and Backup Land at Mutton Island

As the environmental studies undertaken had indicated Lough Atalia (Priority Habitat) and the River Corrib (Salmon and other species) as being important, it was decided to also study a

situation where all of the new port land and facilities would be placed at Mutton Island. This became alternatives 5 to 8

Alternatives 9 - 11: Relocation of GHEP Infrastructure to Mutton Island

Alternative means of provision of road and rail access to Mutton Island are required to be shown for the above circumstances. Some of these alternatives begged the question of how best the road and rail link would come through the existing Galway Harbour Enterprise Park (GHEP) which leads to the latter set of alternatives 9 to 11 which entail the moving of all new and the existing GHEP to Mutton Island.

Table 3.6.1 sets out the 11 alternatives, scored on 8 environmental issues and shows the basis of the scores awarded all as marked against the Renmore proposal.

Table 3.6.2 details the respective contributing areas and land uses for input into table 3.6.1.

Appendix 3.2 details the layouts associated with the alternative options.

Assessment of Environmental Issues

The 8 environmental issues used to score Renmore and the 11 Mutton Island alternatives are as follows:

i. New Land Take

This was measured and is noted on Row 1 of Table 3.6.1.

20 points were awarded to this issue as it is a direct reflection of the scale of the alternative and of the impact on the cSAC / SPA. 20 points were awarded to the greatest land take with all others scored pro rata to that.

ii. Intertidal area

Again the relative areas of intertidal footprint are stated to allow a pro rata scoring method. Intertidal area was also awarded 20 points as the intertidal area is deemed to be more vibrant ecologically than much of the subtidal particularly where it is already dredged and thus deemed to be brownfield. It is therefore an important indication of the relative environmental impact of the different alternatives.

iii. Lough Atalia

Considerable study has been undertaken on the Lough Atalia / Renmore Lough system. It is deemed to be a priority habitat as a lagoonal system. Lough Atalia has a low range of species and is deemed to be of “Low Conservation Value” (NPWS).

Renmore Lough has proved to have a somewhat greater range of species but it is also quite poor.

20 points were allocated to the Lough Atalia/Renmore Lough system, as it is considered that there will be a slight reduction in the median salinity although the salinity range will remain the same as a consequence of seaward projection from the G.H.E.P. site. The variation will be caused by the increased freshness of the water in a more canalized River Corrib outfall plume.

Hence the Renmore option was given 20 points and the others were scored on the pro rata extent of their relative canalizing of the River Corrib if any.

iv. Qualifying interests to cSAC / SPA

Each of these were awarded 10 points i.e. again a total of 20 points. The respective ecological contributors to this study scored these as they considered appropriate in light of design construction and operational impacts.

v. Wave deflection / hydrodynamic impacts

The physical shape of the alternative proposals at Mutton and Renmore will each change wave patterns and flow patterns.

As Mutton Island will be exposed to the highest seas coming from the most frequent wind direction i.e. South Westerly this will cause greater wave deflections.

The Renmore projections while in more tranquil waters will conversely have greater salinity and river flow rerouting impacts.

10 points were allocated to the Mutton impacts and 5 points to the Renmore impacts because of the relative potential scale of those impacts on the outer Harbour area. These were then attributed pro rata to scale of respective projections.

vi. Construction rock dredging

Rock dredging will require drilling, blasting and excavation which are disruptive and, while lesser in volume to silt dredging, require to be minimized and to be scored accordingly. 15 points were awarded pro rata to volumes estimated.

vii. Construction silt dredging

This was awarded 15 points, broken into 10 points for volume and 5 points for complexity. The 5 points for complexity relates largely to tunnel works which would be part trench, part refill, which will make silt dispersal control more difficult. The control of the bulk silt dredge when it is taken directly to a vessel or pipeline and directly to a lagoon, with no further interaction with water, is deemed to have maximum control, minimum complexity. The 10 points on this element were awarded pro rata to volume, as were the 5 points for complexity.

viii. Total maintenance dredging area

Maintenance dredging of both new and existing areas which will be required in the future were included, and are stated in row 8.

Maintenance dredging will only be required about every 10 years as at present. Benthic communities recover within about 12 months of dredging.

10 points were deemed to be the appropriate points to allocate when compared with the total of points given to other subjects.

The scoring was pro rata to relative areas of dredging.

Scoring

The total scoring range was 0 to 135, with 135 being the worst possible.

Renmore scored 71.9.

The allocation of points and scores was robustly set to be seen not to favour any particular proposal i.e. being pro rata to area rather than on ranking position on an issue and by allocating a 20/20 on Lough Atalia, albeit that the median salinity reduction is a relatively small percentage of existing median salinity. Renmore scored most highly on the silt dredge issue because of volume but favourably on the rock dredge point. It scored lowest in 5 out of the 8 criteria, showing that it was best in all those classes.

The nearest Mutton Island rival to Renmore was alternative No. 5 which was the all new facilities to Mutton accessed via the Claddagh, This scored 82.1 (versus 71.9).

Alternatives 4, 3 and 7 all were very close to Alternative No. 5 i.e. within one point; alternative 7 was at 83.1 points. Alternative 5 appears the most practical of the set of 4 close runners but all would create very considerable upsets in other fashions regarding visuals, conservation, amenities etc. Alternatives 6, 10 and 2 while more ecologically damaging would be more practical and viable than 5, 4, 3 and 7.

Conclusion

The Renmore proposal is the preferred ecological / environmental solution to providing the required Port facilities for Galway, and is also the most viable.

	Renmore Option	Part Mutton Island/ Renmore via Claddagh Alt 1	Part Mutton Island/ Renmore via Nimmo's Alt 2	Part Mutton Island/ Renmore via Long Low Bridge Alt 3	Part Mutton Island/ Renmore Seaward Tunnel Alt 4	All New at Mutton Island access via Claddagh Alt 5	All New at Mutton Island access via Nimmo's Alt 6	All New at Mutton Island via Low Bridge Alt 7	All New at Mutton Island, Access via Tunnel Alt 8	All New & GHEP relocation at Mutton Island via Claddagh Alt 9	All New & GHEP relocation at Mutton Island via Nimmo's Alt 10	All New & GHEP relocation at Mutton Island via Long low bridge Alt 11
New Land Take (20)	26.93 ha 13.3	29.04 ha 14.3	30.71 ha 15.1	25.93 ha 12.8	30.20 ha 14.9	27.57 ha 13.6	28.07 ha 13.8	27.87 ha 13.7	31.90 ha 15.7	40.15 ha 19.8	40.65 ha 20.0	40.45 ha 19.9
Intertidal Area (20)	6.82 ha 3.5	17.51 ha 9.1	20.14 ha 10.5	15.91ha 8.3	15.12 ha 7.8	27.71 ha 14.4	30.08 ha 15.6	28.53 ha 14.8	28.86 ha 15.0	37.76 ha 19.6	38.53 ha 20.0	38.33 ha 19.9
Lough Atalia Impact (20)	Maximum Internal 20	Medium Internal Claddagh Bridge 10	Medium Internal, Nimmo's Bridge 12	Medium Internal, Long low Bridge 11	Medium Internal Seaward Tunnel 11	No internal, Claddagh Bridge 0	No internal, Nimmo's Bridge 2	No internal Longest low bridge 0	Medium Internal Seaward Tunnel 0	No internal 0	No internal, Nimmo's Bridge 2	 0
Qualifying Interests cSAC (10) SPA (10)	 3.0 5.0	 6.0 7.0	 6.0 7.0	 4.0 7.0	 4.0 7.0	 6.0 8.0	 6.0 8.0	 6.0 8.0	 6.0 8.0	 7.0 8.0	 7.0 8.0	 7.0 8.0
Wave Deflection / Hydrodynamic Impacts Mutton (10) Renmore (5)	Internal 0 5	External + Part Internal 9.8 2.8	External + Part Internal 9.8 2.8	External + Part Internal 9.8 2.8	Ext + Int + Max Tunnel 9.8 3	External Medium 9.9 0	External Medium 9.9 0	External Medium + Long low bridge 9.9 0.1	External Medium + Tunnel Entrance 9.9 0.1	External Maximum 10 0	External Maximum 10 0	External Maximum 10 0.2
Construction Rock Dredging (15)	24,000m^3 2.9	84,800m^3 10.3	84,800m^3 10.3	89,800m^3 10.9	94,800m^3 11.5	121,200m^3 14.7	121,700m^3 14.8	123,300m^3 15.0	121,200m^3 14.7	102,150m^3 12.4	102,650m^3 12.5	104,250m^3 12.7
Construction Silt Dredging Volume (10) Complexity (5)	1,815,000 10 0	1,175,000 6.5 0	1,175,000 6.5 0	1,169,000 6.4 0	1,227,500 (incl Tunnel 195,000) 6.8 5	1,063,000 5.9 0	1,063,000 5.9 0	1,081,000 6.0 0	1,272,000 (incl Tunnel 208,000) 7.0 5	996,000 5.5 0	996,000 5.5 0	1,014,000 5.6 0
Total Maintenance Dredging Area (10)	47.69 ha 9.2	50.17 ha 9.7	50.17 ha 9.7	51.84 ha 10	46.32 ha 8.9	49.78 ha 9.6	49.78ha 9.6	49.78 ha 9.6	49.78 ha 9.6	48.82 ha 9.4	48.82 ha 9.4	48.82 ha 9.4
TOTAL RANKED ANALYSIS SCORE (135)	71.9	85.5	89.7	83.0	82.9	82.1	85.6	83.1	91.0	91.7	94.4	92.7
RANKING POSITION	1	6	8	4	3	2	7	5	9	10	12	11

Table 3.6.1 – Ranked Analysis Criteria (weighted value in brackets)

	Renmore Option	Part Mutton Island/ Renmore via Claddagh Alt 1	Part Mutton Island/ Renmore via Nimmo's Alt 2	Part Mutton Island/ Renmore via Long Low Bridge Alt 3	Part Mutton Island/ Renmore Seaward Tunnel Alt 4	All New at Mutton Island/ access via Claddagh Alt 5	All New at Mutton Island/ access via Nimmo's Alt 6	All New at Mutton Island via Low Bridge Alt 7	All New at Mutton Island, Access via Tunnel Alt 8	All New & GHEP relocation at Mutton Island via Claddagh Alt 9	All New & GHEP relocation at Mutton Island via Nimmo's Alt 10	All New & GHEP relocation at Mutton Island via Long low bridge Alt 11
Development within SAC (ha)	80.75	78.08	79.92	78.28	74.98	70.47	72.71	74.21	79.29	83.30	85.33	84.44
Intertidal Area Impacted (ha)	6.82	17.51	20.14	15.91	15.12	27.71	30.08	28.53	28.86	37.76	38.53	38.33
Add. Existing Docks Channel Maintenance	1.31	8.70	8.70	8.70	8.70	8.70	8.70	8.70	8.70	8.70	8.70	8.70
YARDS/QUAYS/ LANDSCAPING												
Commercial Port Yard Area (ha)	9.73	9.73	9.73	9.73	9.73	9.73	9.73	9.73	9.73	22.78	22.78	22.78
Commercial Quay Area (incl wave walls) (ha)	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Harbour Company Warehouse Yards (ha)	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53
Marina Boat Yard, Quay and Village (ha)	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83
Fishing Pier and Yard Area (ha)	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
Landscaping and Nautical Amenity Area (ha)	6.26	6.26	6.26	6.26	6.26	6.26	6.26	6.26	6.26	6.26	6.26	6.26
SUBTOTAL (ha)	21.90	21.90	21.90	21.90	21.90	21.90	21.90	21.90	21.90	34.95	34.95	34.95
ASSOCIATED ACCESS (ROADS / RAIL /MARINE)												
Roads and Rail – GHEP (ha)	6.17	3.16	3.90	3.86	3.70	-	1.29	1.90	1.90	-	1.46	1.86
Roads and Rail Access to Mutton Isl.	-	5.14	4.90	3.44	8.30	5.48	4.90	7.30	12.32	5.14	4.75	5.35
Commercial Port Dredged Area (ha)	32.56	28.26	28.26	28.26	28.26	28.26	28.26	28.26	28.26	28.26	28.26	28.26
Marina and Existing Docks Access Dredged Area (ha)	13.92	13.21	13.21	14.88	9.36	12.82	12.82	12.82	12.82	11.86	11.86	11.86
Breakwaters and Revetments Area (ha)	3.04	4.17	4.65	3.79	3.55	1.58	2.25	1.58	1.58	1.58	2.08	2.08
Marine Construction Working Area (ha)	5.30	4.56	5.20	3.35	3.06	2.46	2.94	2.46	2.46	2.36	2.82	2.36
SUBTOTAL (ha)	60.99	58.78	60.12	57.58	56.23	50.60	52.46	54.32	59.34	49.20	51.23	51.77
Total Development Area (ha)	82.89	80.68	82.02	79.48	78.13	72.50	74.36	76.22	81.24	84.15	86.18	86.72

Table 3.6.2 – Areas of Impact on SAC

3.7 ALTERNATIVE PORTS BEYOND GALWAY BAY

3.7.1 Criteria

Alternative sites beyond Galway Bay must be capable of meeting the objectives for the new facility as outlined in Chapter 2. National policy supports the development and continuing role of a hierarchy of ports, in the interests of sustainability and balanced regional development. In this respect, a network of ports facilitates the "proximity principle" and is vital to the economic wellbeing of the regions.

As outlined in Section 4, the National Ports Policy categorises ports into Ports of National Significance and Ports of Regional Significance. The function/role of a regional port is to serve its particular region while a national port, on the other hand, fulfils both a regional role within its hinterland and a national role. Consequently no other regional port can fulfil Galway's role within its region, while a Port of National Significance could potentially serve the Galway region. The assessment of alternative ports beyond Galway Bay therefore excludes other Ports of Regional Significance but includes ports of National Significance Tiers 1 & 2.

3.7.2 Qualifying Criteria

The qualifying criteria for the identification of alternatives beyond Inner Galway Bay were drawn from the GHE project objectives as stated at Chapter 2. These criteria require a port capable of handling a range of commodities with sufficient quay length, vessel draft capacity and available land to accommodate the region's long term needs. The following are the qualifying criteria for the purposes of identifying a short list of sites.

Brief Requirements	Qualifying criteria
Available land	Min. 40ha
Vessel draft capacity	Capable of handling vessels of max. 8m draft float in all tides
Total available quay length	660m
Capable of handling a range of commodities	Have existing landside infrastructure
Link to established transport/distribution network	Rail access & national road access
Proximity Principle	Within 1 hour/100km of customer/region
SEVESO	SEVESO compliant storage facilities (i.e. petroleum & bitumen)

Table 3.7.1 - Qualifying Criteria in identifying a shortlist of sites

The qualifying criteria listed above require sufficient capacity to cater for the region's long term needs in a sustainable manner. In this regard, the objectives involve the utilisation of or expansion of established commercial port facilities and infrastructure:

- Available land: Taking into account established landside capacity together with projected long term requirements over a 30 year timeframe, a land requirement of 40ha minimum to accommodate both open and covered storage as deemed necessary
- Draft capacity: The brief requires a port capable of handling vessels with 20,000 tonne capacity which is deemed to be the minimum commercially viable vessels size and draft capacity was determined on this basis
- Quay length: Sufficient quay length to accommodate 2 no. 20,000 tonne vessels berthing at any one time is required in order to meet the project objectives

- Commodities: In line with its role, as identified in NPP, servicing the west region, the port must be capable of handling a range of commodities including dry and liquid bulk cargos
- Access to region: The new port must have access to the national transport network in order to fulfill its role as a regional port. Both national road and rail networks were deemed to be a requirement in this regard.
- SEVESO: The new port must be capable of handling commodities such as petroleum and bitumen in a manner which complies with the SEVESO directive, particularly with regard to proximity to residential or built up areas, major employment centres etc.

Satisfying all of the criteria listed above is deemed necessary to meet the project objectives.

3.7.3 Ports of National Significance Tiers 1 & 2

The qualifying criteria outlined in Tables 3.7.2 to 3.7.6 were applied to the 5 no. Ports of National Significance designated in the NPP. These are Dublin Port, Port of Cork, Shannon Foynes Port, Rosslare Europort and Port of Waterford. Each of these ports were assessed against the qualifying criteria as set out in the following tables.

Brief Requirements	Available infrastructure
Available land	45.25ha (including 41ha for hazardous materials)
Vessel draught capacity	9-11m
Total available quay length	1,974
Capable of handling a range of commodities	Liquid, dry bulk, break bulk, Ro Ro, Lo-Lo
Link to established transport/distribution network	M50 Rail - Yes
Hazardous Materials Storage	Yes
SEVESO	Yes

Table 3.7.2 - Dublin Port

Brief Requirements	Available infrastructure
Available land	40.4ha
Vessel draught capacity	5.6-13.5m
Total available quay length	2,237m
Capable of handling a range of commodities	Lo-Lo, Ro-Ro, liquid, dry bulk, break bulk
Link to established transport/distribution network	N25/N25 Rail - No
Hazardous Materials Storage	Yes
SEVESO	Yes

Table 3.7.3 - Port of Cork

Brief Requirements	Available infrastructure
Available land	53.5ha
Vessel draught capacity	10.5m
Total available quay length	560m
Capable of handling a range of commodities	Dry & Liquid Bulk, Special, Heavy Lift, Ro. Ro., Lo Lo, container handling
Link to established transport/distribution network	National Road Rail – Yes
Hazardous Material Storage	Yes
SEVESO	Yes

Table 3.7.4 - Shannon Foynes Port

Brief Requirements	Available infrastructure
Available land	10ha
Vessel draught capacity	7.2-10m
Total available quay length	962m
Capable of handling a range of commodities	Ro-Ro, Lo-Lo,
Link to established transport/distribution network	N25/E30 Rail - Yes
Hazardous Materials Storage	No
SEVESO	Unknown

Table 3.7.5 - Rosslare Europort

Brief Requirements	Available infrastructure
Available land	5.26ha
Vessel draught capacity	8-10m
Total available quay length	970m (includes 120m private quay)
Capable of handling a range of commodities	Dry bulk, break bulk, liquid, Lo-Lo
Link to established transport/distribution network	N25 (via R448) Rail -Yes
Hazardous Materials Storage	No
SEVESO	Unknown

Table 3.7.6 - Port of Waterford

3.7.4 Evaluation of Candidate Ports

The following table is a summary of the assessment of the candidate ports under the qualifying criteria.

Criteria	Qualifying Ports	Discounted Ports
Available port land	Dublin Port Port of Cork Shannon Foynes	Rosslare Waterford
Vessel draught capacity	Dublin Cork Shannon Foynes Rosslare Waterford	
Total available quay length	Dublin Cork Shannon Foynes Rosslare Waterford	
Capable of handling a range of commodities	Dublin Cork Shannon Foynes Waterford Rosslare	
Link to established transport/distribution network	Dublin Cork Shannon Foynes Rosslare	Waterford
Hazardous Material Storage	Dublin Cork Shannon Foynes Waterford Rosslare	
SEVESO	Dublin Cork Shannon Foynes	Rosslare Waterford
All of the above criteria	Dublin Cork Shannon Foynes	Rosslare Waterford

Table 3.7.7 - Evaluation of Candidate Ports

The outcome of this assessment, as shown in Table 3.7.7 above demonstrates that 3 no. ports namely Dublin, Cork & Shannon Foynes met all of the selection criteria in that they have sufficient available land, vessel draught, quay length, wet and dry bulk cargo facilities, links to established transport/distribution network, hazardous materials storage and compliance with SEVESO Directive.

3.7.5 Proximity Principle

Having identified those ports which met all of the qualifying criteria, the next step was to assess each of these in terms of meeting the project objectives.

As an Island nation, where the vast bulk of commodities and raw materials consumed come from abroad, shipping is the most important transport mode for the economy. As the bulk of imports and exports are transported by sea, there is an opportunity to ship goods closest to the region and customers served. This is the best approach in terms of environmental sustainability by minimising transport distances and trips by road between the port and its hinterland, which is fundamental to economic development and competiveness, particularly in an economy heavily dependent on both imports and exports.

Fulfilling the GHE objectives in terms of serving a regional customer base/hinterland therefore requires the port to be within an acceptable travel time/distance of its hinterland/customer base. This was determined as preferably 1 hour / 100KM and max. 1½ hours or 150KM from Galway City, as the regional gateway and main population centre within the region. The distance measured therefore from those ports which met the qualifying criteria to Galway City Centre is outlined in Table 3.7.8 below.

Port	Distance from Galway City Centre (kilometres)
Dublin Port	218.5
Port of Cork	200.8
Shannon Foynes Port	131.3

Table 3.7.8 - Proximity to Galway

3.7.6 Shortlisted Ports

On the basis of the travel time/distance, outlined in Table 3.7.8 above, Dublin & Cork ports have been discounted as alternatives to GHE on the basis that they do not satisfy the proximity principle, and are therefore less sustainable in terms of servicing Galway City by means of road or rail. This leaves Shannon Foynes as the only remaining port.

3.7.7 Evaluation of Shortlisted Port

Having eliminated Dublin & Cork ports for the reasons identified above, the next step in the evaluation process is to determine whether Shannon Foynes fulfils national and regional policy in terms of both balanced regional development and sustainable development and provides a feasible alternative to GHE from a socio-economic and environmental perspective. To assist in this evaluation process, DKM Economic Consultants were commissioned to prepare both a cost benefit analysis of GHE, followed by a report on the feasibility of Shannon Foynes as an alternative port location to serve Galway Ports region. The report on the Shannon Foynes alternative concludes that there are compelling reasons why the alternative solution of the port of Shannon Foynes servicing Galway Port's region, is not feasible from a policy, socio-economic and environmental perspective and that the Applicant and the Design Team consider that there are overriding reasons of public interest why GHE should proceed.

The DKM report is attached as an appendix to the EIS (Appendix 3.3) and the following table is an extract from this report, summarising the impacts of proceeding and not proceeding with GHE, in the context of policy, socio-economic and environmental considerations:

Dimension	Impact of GHE Proceeding	Impact of GHE Not Proceeding
National Ports Policy (NPP)	Realisation of national policy requires the project to proceed, specifically in terms of: • Servicing Galway's substantial hinterland. • Accommodation of larger vessels in deeper waters. • Strategic hub for petroleum logistics & storage. • Refocusing of the Inner Harbour towards leisure and tourism, and reconnection with the city. • Servicing the offshore renewable energy, oil and gas sectors.	• GHC's hinterland will be less well served by port infrastructure, and will suffer competitiveness disadvantage vis à vis other regions. • GHC will remain unable to cater for larger vessels. • Continuing role as petroleum hub in question. • Inner harbour's capacity to cater for leisure/tourism traffic remains constrained, and disconnected from city. • Servicing of offshore energy sector will migrate to more distant port, or outside of State.
National spatial, industrial development & employment policy	GHE is in accordance with and contributes to meeting *National Spatial Strategy*, IDA Ireland's *Horizon 2020 Strategy*, and *Action Plan for Jobs,* specifically regarding balanced regional development.	Regional aspects of these policies will be more difficult to deliver, as infrastructure of West and BMW regions will be less competitive vis à vis other regions.
Commercial & Socioeconomic	Project is commercially viable, caters for GHC's natural catchment, and generates substantial wider economic benefits. It also generates and maintains significant employment.	Commercial future of GHC will be damaged. Wider economic benefits will be reduced and in some cases lost (notably tourism). Employment gain would be largely lost.
Environmental	• GHE will cater for the relevant trade in a significantly less land-transport-intensive way, reducing global, regional and local emissions to air, as well as minimising road damage and congestion. • Seveso site will be more distant from city centre, with safety benefits and positive implications for planning in city centre.	• Significant increases in global, regional and local emissions to air, as well as road damage and congestion, if business has to be catered for via more distant port. • Seveso impacts on city centre will remain.

Table 3.7.9 - Impacts of Proceeding with and not proceeding with GHE

Source: DKM Alternative Solutions Report

3.8 ALTERNATIVES – LOCATIONS ABROAD

The objectives for GHE require the development of a port capable of handling a range of commodities, both import and export. As an Island, alternatives such as road and rail transport are not an option as they merely serve the movement of goods within the Country. Alternative ports, outside of the island of Ireland, therefore do not meet the project objectives.

3.9 CONCLUSION OF ASSESSMENT OF ALTERNATIVES

The preceding sections have outlined the assessment of alternatives in terms of the following scenarios:

- Do-nothing
- Improvements to existing Inner Harbour
- Alternative Scale/design
- Alternative locations in Inner Galway Bay
- Alternatives locations/ports beyond Galway Bay
- Alternative locations abroad

The following conclusions have been drawn from this exercise:

- Project objectives cannot be met in a 'do nothing' scenario
- The outcome in the case of improvements to the existing Inner Harbour is similar to the 'do nothing' scenario
- The alternative scales/designs and alternative locations in Inner Galway Bay are more damaging to the Natura 2000 site
- Alternatives beyond Galway Bay do not meet the project objectives
- The project aims cannot be met by locating the facility abroad

GHE therefore represents the least damaging option environmentally in terms of meeting the project objectives, including compliance with national policy and the socio-economic wellbeing of the region.