Shannon Foynes Port Company

Vision 2041 SEA Environmental Report

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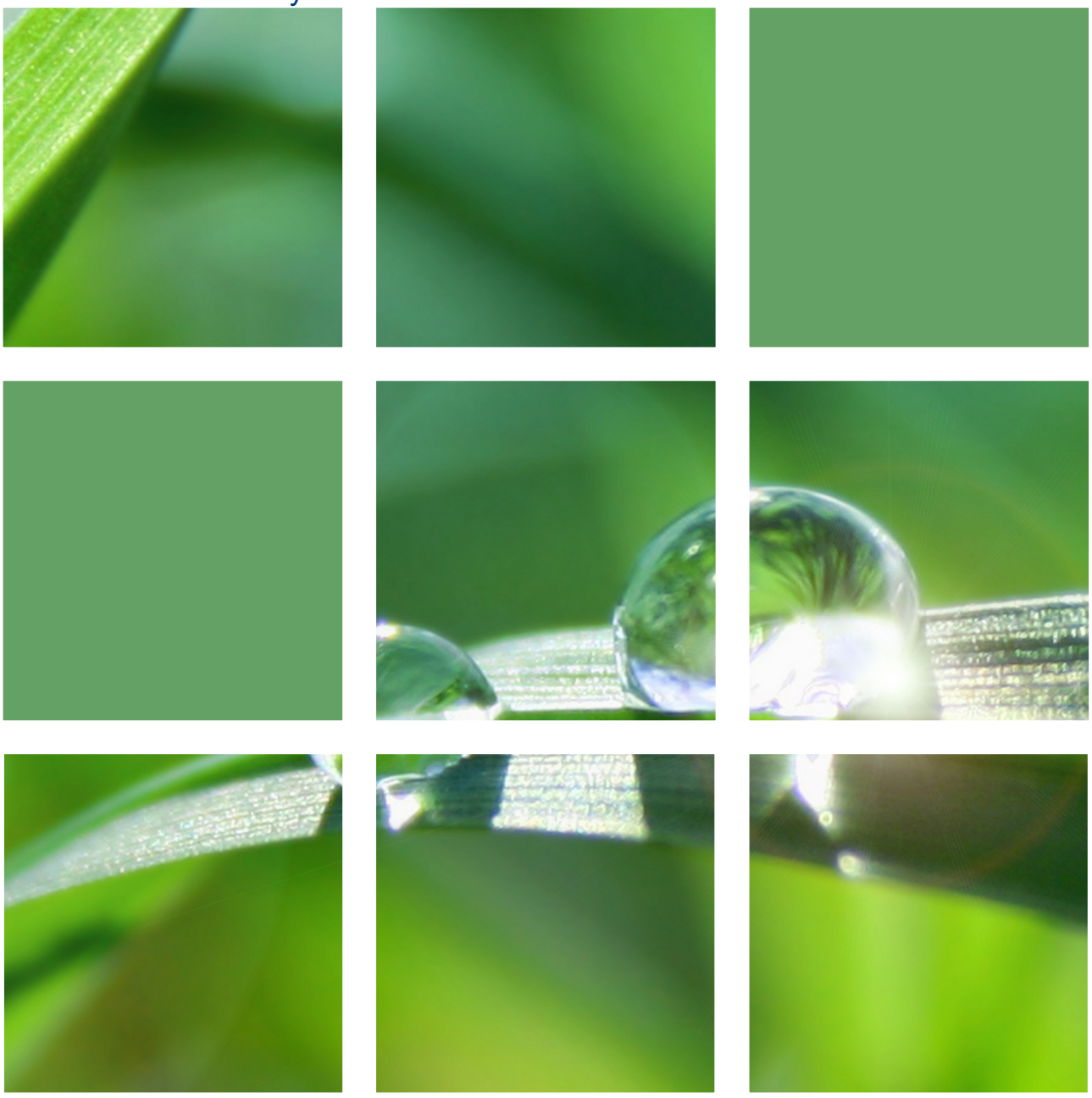

Strategic Environmental Assessment of Shannon Foynes Port Company Vision 2041

Environmental Report

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INTRODUCTION

Through early consultation with the statutory authorities in relation to Shannon Foynes Port Company (SFPC) Vision 2041 document it was considered the potential for likely significant effects to arise from the implementation of the proposed objectives and options and therefore a determination was made through the SEA Scoping Study to undertake full SEA in line with the SEA Directive.

The development of the Vision 2041 document has been aligned with the development of the Shannon Integrated Framework Plan (SIFP) for which a lengthy and detailed SEA process was also undertaken in accordance with the SEA Directive and associated regulations. SFPC has been a committed and active member of the SIFP Steering Group and therefore the finalisation of the Vision 2041 document has been carefully informed by the outcome of the SIFP process and the Draft Plan and associated SEA Environmental Report and Habitats Directive Assessment Natura Impact Report which are currently out for consultation.

While Vision 2041 is not a statutory landuse plan, SFPC has considered it best practise to undertake such an assessment and to clarify SFPC's strategic planning and vision for medium to long term port development under the umbrella of the SIFP for the Shannon Estuary.

METHODOLOGY AND CONSULTATION

This Environmental Report contains the findings of the assessment of the likely significant effects on the environment of the proposed Vision 2041. The report reflects the requirements of the SEA Directive (2001/42/EC) on the assessment of the effect of certain plans and programmes on the environment and also the transposed regulations 2004 (S.I. 435/2004) and the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (S.I. 436/2004). Further to the transposition of this Directive two amending regulations which were signed into Irish law on the 3rd of May 2011 (amending the original transposing regulations):

- **European Communities (Environmental Assessment of Certain Plans and Programmes) (Amendment) Regulations 2011**, (S.I. No. 200 of 2011), amending the *European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004* (S.I. No. 435 of 2004), and
- **Planning and Development (Strategic Environmental Assessment) (Amendment) Regulations 2011**, (S.I. No. 201 of 2011), amending the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (S.I. No. 436 of 2004).

Consultation was carried out with the statutory consultees (Environmental Protection Agency, Department of Communications, Energy and Natural Resources, Department of Agriculture Food and Marine, Department of Environment Community and Local Government, the Development Applications Unit and the National Parks and Wildlife Service. Taking into consideration the feedback from these

consultees a broad assessment of the potential for the Plan to influence the environment has been carried out. All the environmental topics listed in the SEA Directive have been scoped in for the assessment of Vision 2041, which are as follows:

- Air
- Biodiversity, Flora and Fauna
- Climatic Factors
- Cultural, Architectural and Archaeological Heritage
- Human Health
- Landscape
- Material Assets
- Population
- Soil
- Water

Vision 2041 is a local Plan that has the potential to have effects on a Regional scale. The main scientific assessments have been limited to within a few kilometres of any potential navigation line options; however certain assessments have been carried out to include the wider region. In line with the SEA Directive, short, medium and long-term impacts have been considered during the assessment, with these representing the construction, initial operation and long-term operation of the navigation respectively.

As Vision 2041has the potential to impact upon Natura 2000 sites there is a requirement under the EU Habitats Directive to carry out an Appropriate Assessment and to produce a Natura Impact Report. These sites are areas designated for the protection and conservation of habitats, flora and fauna, called Special Areas of Conservation and Special Protection Areas.

DESCRIPTION OF THE PLAN

Ireland's national ports policy recognises the crucial role ports will play in facilitating future economic growth. While the most recent analysis pushes out the timeline within which substantial additional port capacity will actually be required, it is nationally recognised that new capacity will be required in the medium to long term, and this need to be planed now. National ports policy supports a market driven approach to port investment and acknowledges that commercial port operators are best placed to make decisions about such investments. Whilst the role of ports policy is to create an environment in which such investment is facilitated and encouraged, the ports policy encourages ports to generate viable port capacity projects to ensure the availability of adequate modern facilities and to promote competition between ports. The European Commission's Communication on a European Ports Policy notes that ports should be ruled by long term strategic vision and planning. Furthermore, port master planning is recognised in national ports policy as a transparent method of aiding the engagement of local communities in the long term planning of ports. Therefore, best practice would indicate that a strategic vision for ports should be prepared to frame and guide future port development. Within this context, SFPC has developed a thirty year strategic vision for the provision of port infrastructure and services for their operations on the Shannon Estuary.

The purpose of the SFPC's Vision 2041 is to:

- Clarify SFPC's strategic planning and vision for medium to long term port development;
- Ensure that the port and its infrastructure requirements remain at the heart of national, regional and local planning policy
- Inform port users and the local community of the Port Development Strategy;
- Attract future investment with a clear and concise development strategy;
- Establish a platform for future developments, which will reduce the lead time for individual projects; and
- Provide a clear understanding of the sensitive environment that comprises the Estuary. Vision 2041 has been informed by the Guidance on Port Master Plans Consultation Document.

ENVIRONMENTAL BASELINE

Baseline environmental information was gathered under each of the SEA topics at a strategic level to outline the main environmental issues in the area and the potential features that could be impacted by implementing of Vision 2041. The main issues in the area of the SFPC Vision 2041 are as follows:

Environmental Topic
Biodiversity, Flora and Fauna
Population / Human Health
Soil
Water
Air / Climate
Material Assets
Cultural, Architectural and Archaeological Heritage
Landscape

Parts of the Lower Shannon Estuary are currently designated a Special Protection Area (SPA) for birds with a further proposed designation in place which will see the current SPA boundary extended to the outer part of the estuary. It is also a candidate Special Area of Conservation (cSAC) and proposed Natural Heritage Area (pNHA). The Shannon Estuary is well documented as containing areas of High Landscape Value, natural heritage that is rich in biodiversity, it has provided a transport corridor for humans for thousands of years is rich in archaeological heritage and provides enormous resources in terms of employment, recreation and tourism amongst others. It is against this backdrop of internationally protected sites, historical loss of intertidal habitat from extensive land reclamation[1], potential future loss of habitat from "coastal squeeze" and the need to protect the internationally important numbers of bird species and their habitat that has led to the integrated resources of Clare Co. Council, Limerick City and County Councils, and Kerry County Council, along with particular

[1] http://www.ucd.ie/gsi/pdf/38-1/clare.pdf

stakeholder interests represented by Shannon Foynes Port Company, and Shannon Development, with further stewardship by the relevant state authorities to develop the SIFP for the Shannon Estuary.

SFPC have been a key stakeholder involved in this process and therefore it is within this framework and future stewardship that Vision 2041 is developed taking into account these complex array of factors and considering the outcomes of the SIFP process.

In accordance with the SEA Directive, the inter-relationship between the SEA environmental topics must be taken into account. **Table 1.0** highlights the key inter-relationships identified in this SEA. Of particular note is the primary interrelationship between water (quality and quantity) and biodiversity, flora and fauna, soils, human health and population. Flora and fauna rely directly on the aquatic environment as a habitat but the terrestrial environment can also be strongly impacted by the aquatic environment. Water quality is also of particular importance with regard to human health as it provides a source of drinking water and it yields foodstuffs (e.g. fish and shellfish). Water is also used for leisure and recreational purposes, providing a material asset both for local populations and as part of the tourism economy.

Table 1 Potential Inter-Relationships between SEA Topics

	Biodiversity Flora, Fauna	Population / Human Health	Soil	Water	Air	Climatic Factors	Material Assets	Archaeological and Architectural	Landscape
Biodiversity Flora, Fauna									
Population / Human Health	✓								
Soil	✓	✓							
Water	✓	✓	✓						
Air	✓	✓	✗	✓					
Climatic Factors	✓	✓	✓	✓	✓				
Material Assets	✓	✓	✓	✓	✗	✓			
Cultural, Archaeological and Architectural Heritage	✗	✓	✓	✓	✗	✗	✓		

Landscape	✗	✓	✓	✓	✗	✗	✓	✓	

✓= interrelationship anticipated ✗ = no interrelationship anticipated

REVIEW OF RELEVANT PLANS, PROGRAMMES AND POLICIES

A review of the Plans, Policies and Programmes relevant to Vision 2041 was carried out at International, European, National, Regional and Local scales. This exercise was carried out with a view to establishing the hierarchical position of Vision 2041, the influence these Plans and Programmes will have on Vision 2041 and how Vision 2041 will interact with the objectives of these other Plans.

ENVIRONMENTAL OBJECTIVES, TARGETS AND INDICATORS

Environmental Objectives, Targets and Indicators were developed for the SEA of Vision 2041 based on the aims and objectives of Vision 2041 and the significant environmental issues in the area. The Objectives and Targets are intended to give a high level of protection for the environment in implementing the Plan. The Objectives developed were as follows:

- Objective 1 – Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU and Nationally designated habitats, sites and species. Improve local biodiversity if possible.
- Objective 2 – Provide an economic boost for the region and contribute to environmentally sustainable development.
- Objective 3 – Prevent nuisance dust, noise and odours emanating from port activities.
- Objective 4 – Avoid damage to the function and quality of the soil resource in the study area.
- Objective 5 – Development and operation of SFPC facilities not to cause deterioration in water status of any waterbodies.
- Objective 6 – Minimise emissions to air as a result of development and operation of SFPC facilities.
- Objective 7 – Minimise contribution to climate change by emission of greenhouse gasses associated with development and operation of SFPC facilities.
- Objective 8 – Develop SFPC facilities and provide vehicle for development of new sustainable infrastructure for the region.
- Objective 9 – Avoid damage to cultural heritage features during development and operation of SFPC facilities.
- Objective 10 – Avoid damage to local landscape and vistas.

ALTERNATIVES

There are 10 main Alternatives available within the Vision 2041 plan, which are summarised as follows:

Alternative 1 – This is the "Do Nothing" alternative, whereas Vision 2041 is not implemented and there are no changes in workings or developments at the SFPC facilities.

Alternative 2 (Broadly Equates to Strategic Site D from SIFP) – Effective Utilisation of Existing Assets, whereas SFPC use all the facilities to their full potential over the short, medium and long Term.

Alternative 3 (Broadly Equates to Strategic Site D from SIFP) **–** Port of Foynes Estate Expansion. The Port of Foynes currently has 10ha of land spare for development and needs 127ha to accommodate anticipated growth (high growth scenario). Expansion would have to be landward to the south east. This would take place in the medium and long term.

Alternative 4 (Broadly Equates to Strategic Site E from SIFP) **–** Port of Foynes Remote Operations. This alternative looks into the long term with many Port related activities being carried out remotely, with the most likely location being Askeaton Business Park.

Alternative 5 – Port of Foynes – Additional Berthing Facilities at Foynes. Short term planning, followed by medium and long term development.

Alternative 6 (Broadly Equates to Strategic Site C from SIFP) **–** Port of Foynes – Deep Water Berthage to accommodate Panamax Vessels at one of four potential locations, being Foynes Port Inner Harbour, Foynes Port Western Harbour, Foynes Island and Mount Trenchard. Foynes Island however is the only really suitable location. Short term planning, followed by medium and long term development.

Alternative 7 – Limerick Docks – Future Use of Non Core Assets. Four sites have been highlighted for development throughout the medium and long term:

Alternative 7a – Site 1 – Corcanree Business Park

Alternative 7b – Site 2 – The Wishbone

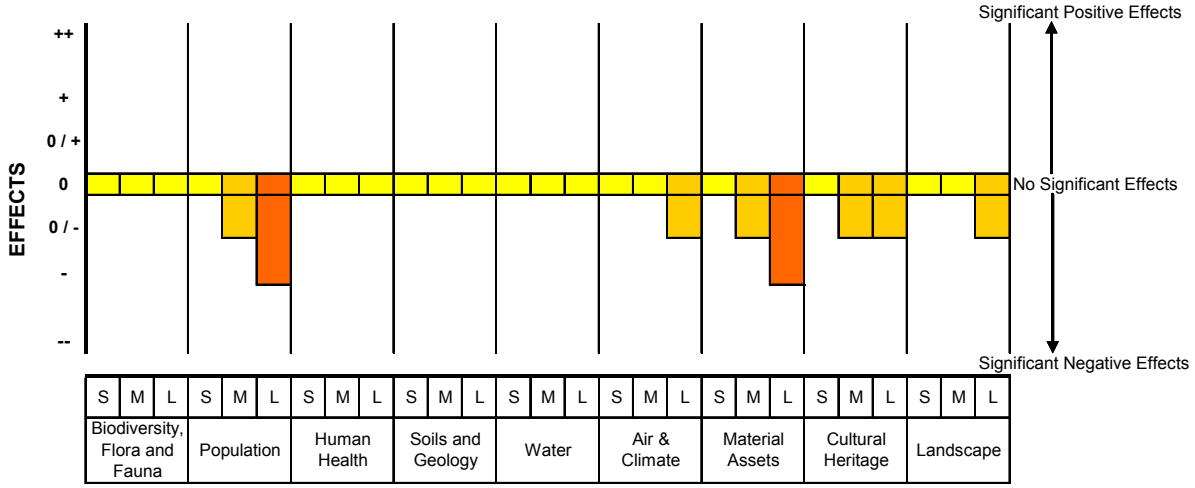
Alternative 7c – Site 3 – Bannatyne Mill Site 4 – Sailors House

Alternative 7d – Site 3 – Sailors House

ASSESSMENT

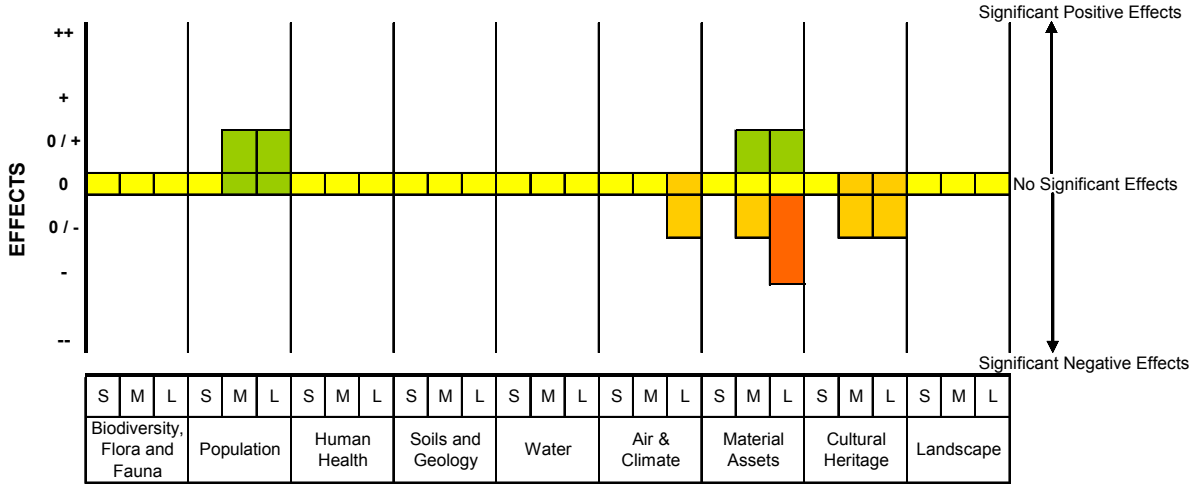
The assessments were carried out by environmental baseline categories and were assessed to give the positive and negative effects, their significance and permanence, any secondary, cumulative or synergistic effects, and any inter-relationship of effects. Each Alternative was given an impact summary table to provide a summary visual representation of the scale of potential positive and negative effects, as shown below:

Assessment Alternative 1 – Do Nothing Option



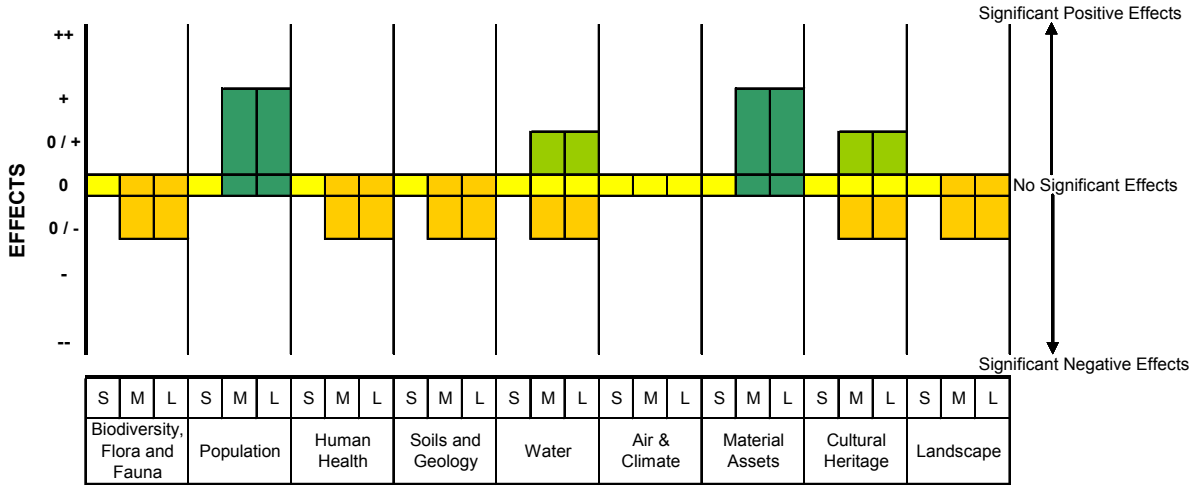
The main interrelationship of effects without the implementation of Vision 2041 would be between material assets and population, whereas the potential inability of the SFPC facilities to continue importing materials and to keep up with modern requirements will mean a lack of development in the region, losses of jobs and potential population shifts to other areas with more employment potential.

Assessment Alternative 2 (Broadly Equates to Strategic Site D from SIFP) – Utilisation of Existing Assets



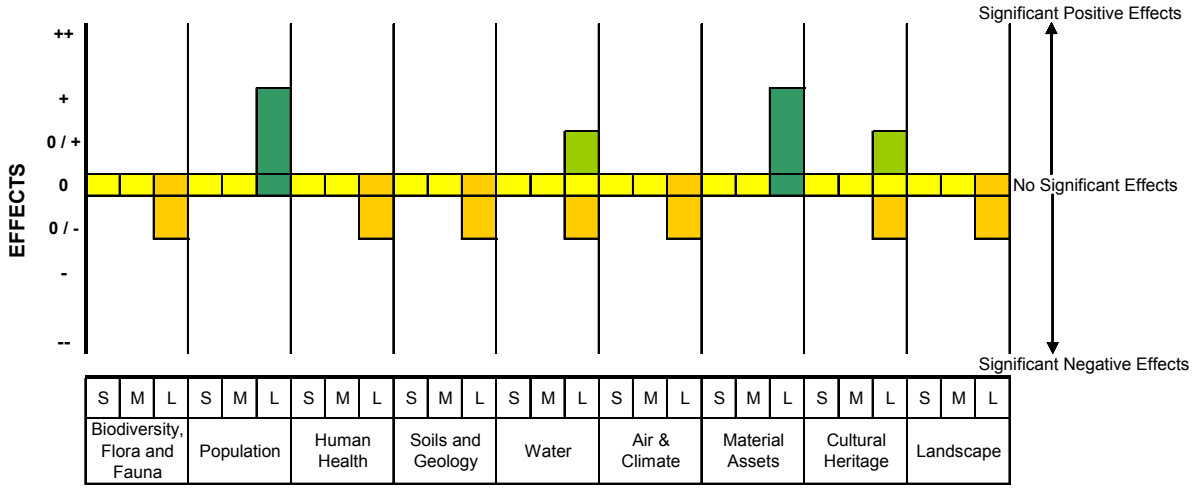
The main interrelationship of effects by effective utilisation of existing assets would be between material assets and population, whereas the potential of the SFPC facilities to continue to operate at some capacity into the medium and long term by continuing to import materials and to keep up with modern requirements will mean there may be some new employment created and some new development in the region. However conversely, as the SFPC facilities may lose out on larger contracts to other similar facilities, which have a greater available capacity, there will be the potential for significant negative impacts in the long term.

Assessment Alternative 3 (Broadly Equates to Strategic Site D from SIFP) – Port of Foynes Estate Expansion



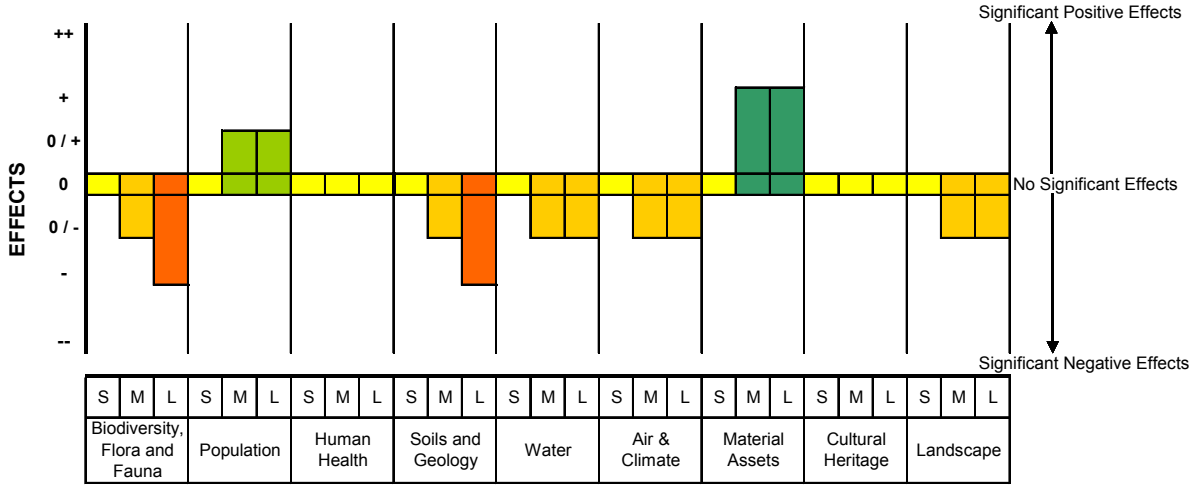
The main interrelationship of effects by expanding the Port of Foynes estate to the south east would be the positive relationship between material assets and population, whereas the development of new SFPC facilities into the medium and long term will create new employment in the region and encourage secondary indirect development. The expansion of the SFPC facilities onto greenfield sites, with a new development footprint, will cause the loss of soil as a growing medium and therefore will reduce biodiversity, flora and fauna in the study area.

Assessment Alternative 4 (Broadly Equates to Strategic Site E from SIFP) – Port of Foynes Remote Operations



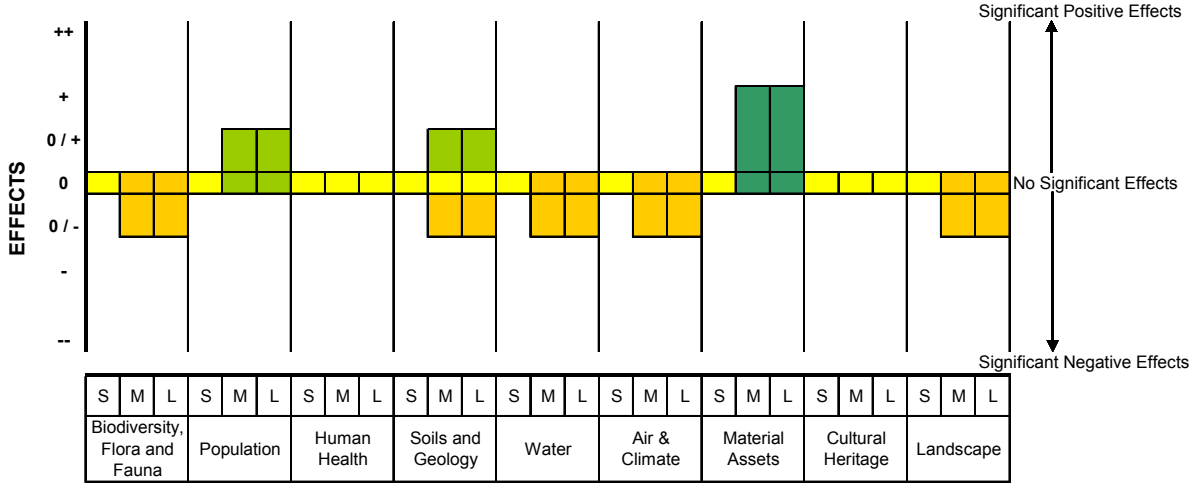
The main interrelationship of effects by developing the Port of Foynes Remote Operations expanding would be the positive relationship between material assets and population, whereas the development of new SFPC facilities in the long term will create new employment in the region and encourage secondary indirect development. The expansion of the SFPC facilities onto greenfield sites, with a new development footprint, will cause the loss of soil as a growing medium and therefore will reduce biodiversity, flora and fauna in the study area.

Assessment Alternative 5 – Additional Berthing Facilities at the Port of Foynes



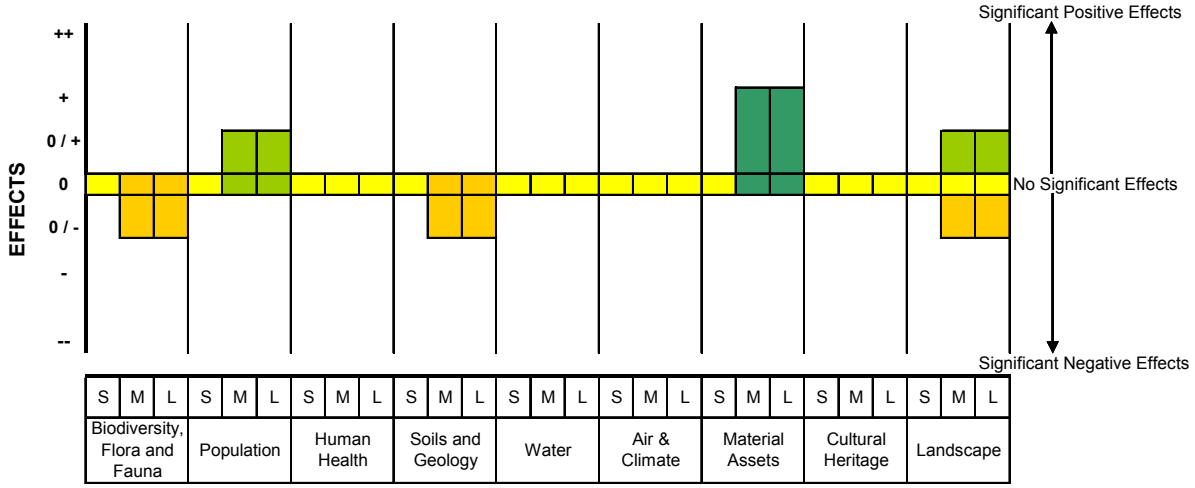
The main interrelationship of effects of adding additional berthing facilities at the Port of Foynes would be the positive relationship between material assets and population, whereas the development of new SFPC facilities into the medium and long term will create new employment in the region and encourage secondary indirect development. The medium and long term impacts on soil, geology and biodiversity, flora and fauna would need to be carefully considered.

Assessment Alternative 6 (Broadly Equates to Strategic SITE C from SIFP) – Deep Water Berthage at Foynes Island



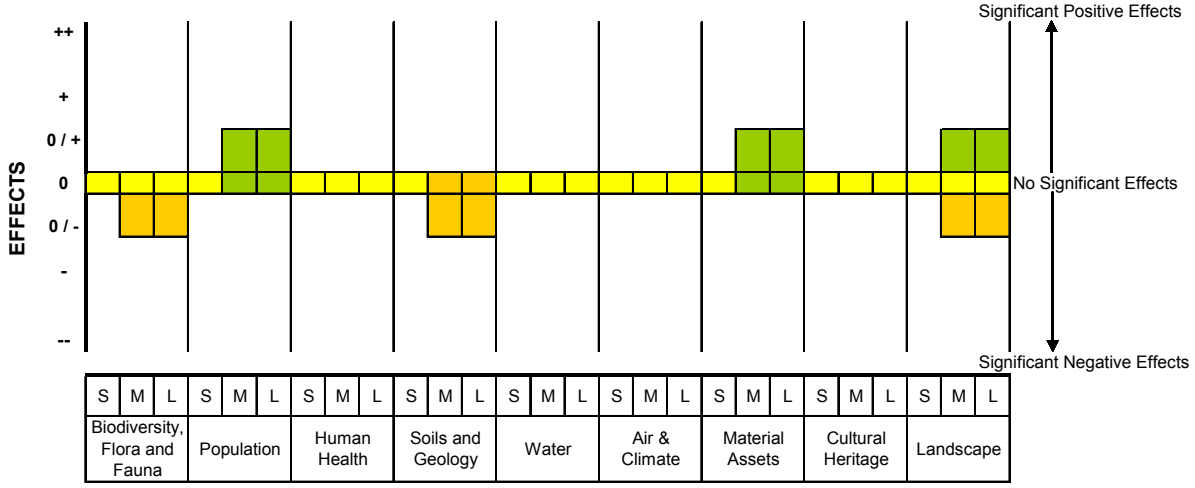
The main interrelationship of effects of adding Deep Water Berthage at Foynes Island would be the positive relationship between material assets and population, whereas the development of new SFPC facilities into the medium and long term will create new employment in the region and encourage secondary indirect development. The medium and long term negative impacts on water, air and climate, biodiversity and flora and fauna together with landscape are all interrelated.

Assessment Alternative 7a – Limerick Docks Corcanree Business Park



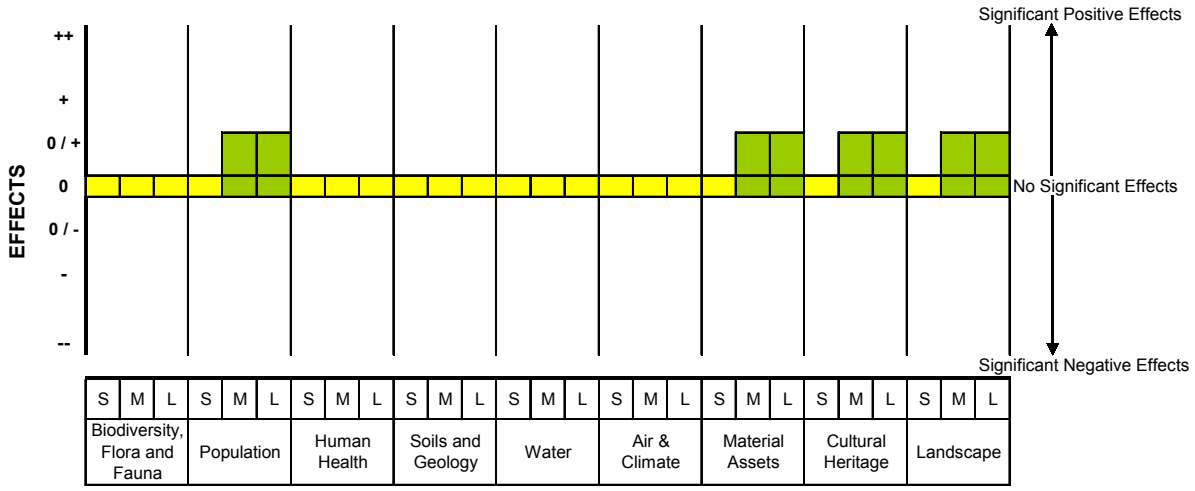
The main interrelationship of effects of developing Limerick Docks Corcanree Business Park would be the positive relationship between material assets and population, whereas the development of new SFPC facilities into the medium and long term will create new employment in the region and encourage secondary indirect development. The medium and long term negative impacts on landscape, soils and geology together with flora and fauna are also inter-related but not envisaged to be significantly negative.

Assessment Alternative 7b – Limerick Docks The Wishbone



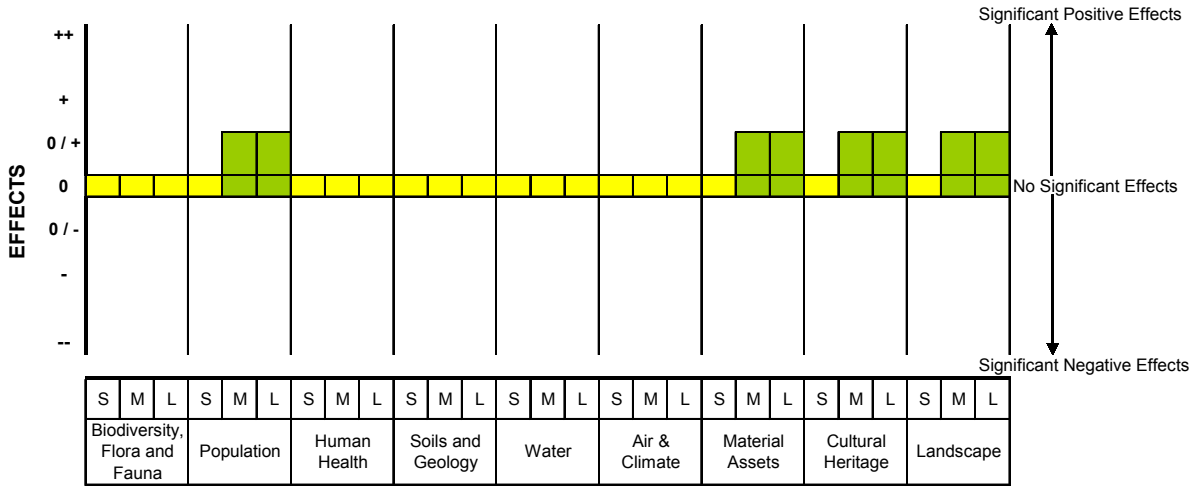
The main interrelationship of effects of developing the wishbone would be the positive relationship between material assets and population, and material assets and landscape. The loss of the soil resource as a growing medium will have a negative impact on biodiversity, flora and fauna. Overall, the negative impacts from this site are minimal and can be mitigated at the project level.

Assessment Alternative 7c – Limerick Docks Bannatyne Mills



Overall the development of this alternative option is deemed to have no significant negative effects. Interrelationships between cultural heritage, material assets and population could be significantly positive. Restoration of a heritage feature provides a new material asset and potential employment opportunities.

Assessment Alternative 7d – Limerick Docks Sailors House



Overall the development of this alternative option is deemed to have no significant negative effects. The effects are deemed to be neutral or positive. Interrelationships between cultural heritage, material assets and population will be significantly positive. Restoration of a heritage feature provides a new material asset and potential employment opportunities.

The joint implementation of various Vision 2041 alternatives at the Port of Foynes has the potential for positive and negative cumulative effects. The greater the number of alternatives implemented the greater the potential negative impacts on biodiversity, flora, fauna, water, soils air and climate, as the development footprints and operational footprints of SFPC facilities encroach more into greenfield sites and habitats. However, conversely the greater the number of alternatives implemented the greater the potential for positive impacts on material assets and population, as more SFPC facilities

become available the greater the mutual benefit they have to one another, the more the indirect assets created and the greater the potential for employment opportunities.

The joint implementation of various Vision 2041 alternatives at the Limerick Docks is likely to have more positive cumulative impacts as the sites generally have a lower potential for negative environmental impacts and their implementation is more mutually beneficial. The distance between the Foynes and Limerick Docks facilities means there is unlikely to be significant positive or negative cumulative impacts between their respective alternatives.

In the assessment it can be seen that there may be significant positive impacts from development of both the Bannatyne Mill and Sailors House, however in reality there may not be the need to restore / re-use both of these facilities, which are slightly remote from one another.

EVOLUTION OF THE ENVIRONMENT IN ABSENCE OF THE PLAN

SFPC Vision 2041 sets out the potential options for the future development of SFPC facilities over the next 30 years, in response to the anticipated pressures of increased tonnages being received in Irish ports. In the absence of the Plan, no development would take place at the existing facilities and therefore there would be no additional capacity to receive and process goods in this area of Ireland, unless received by air freight.

According to a recent EPA report (2010) trends in water quality in Ireland show an overall improvement; however, the rate of this improvement in surface waters is not sufficient to meet the requirement of having good status in all waters by 2015 as required by the Water Framework Directive. The absence of Vision 2041 is not expected to affect this trend.

The trend for air quality in Ireland is a year on year improvement with a reduction in the main pollutant concentrations (with the exception of ozone). The absence of Vision 2041 is not expected to affect this trend. Due to the ongoing improvements in engine technology and the tightening of environmental legislation for vehicle (terrestrial and marine) emissions it would be anticipated that the air quality in the study area would improve in the future. It is however likely that there would continue to be some nuisance air quality issues due to dust, noise and emissions from general port activities.

As a result of manmade greenhouse gas emissions, climate change is predicted to occur in the future regardless of action. The UN Intergovernmental Panel on Climate Change (IPCC) in their *Climate Change 2007: Climate Change Impacts, Adaptation and Vulnerability Report* predict sea level rise, changes in rainfall patterns and temperatures as well as changes in the frequency of droughts and extreme weather events. The potential impacts from sea level increases, increased flooding, summer droughts, etc., will impact on water management. The absence of the Plan is not expected to affect this trend.

According to the EPA report "Implications of the EU Climate Protection Target for Ireland", *'water supply and quality are highly sensitive to climate variability and change. Future changes in climate are likely to have major impacts on water resources in Ireland. Recent research by Murphy and Charlton (2006) outlines spatial changes in run-off for Ireland in future downscaled scenarios. The results highlight the importance of individual catchment characteristics in controlling response to climate change. Reductions in groundwater storage and recharge will increase the risk of drought in some areas. The likelihood and magnitude of flood events are also likely to increase, which has important implications for infrastructure and development on affected flood plains. Also, there will be impacts upon the reliability of existing flood defences, and, in the future, increased insurance costs. Water quality is another area for concern as in certain areas it may be impacted by the contamination of coastal aquifers from saline intrusion'*.

Therefore, evolution of the climatic environment in the absence of the Plan is likely to be heavier winter rainstorms causing more flash flooding, resulting in an increase in diffuse pollution loads from soil run-off and increasing demand for flood controls. These types of flood events (though not directly addressed by the Plan) would continue to pose a risk to soils as a result of erosion and release of contaminants, thus potentially leading to further water quality problems. The absence of the Plan is not expected to affect this trend.

Summer droughts are also likely and recent reports have indicated that the effects of climate change in Ireland will have serious consequences for water resources, resulting in a potential 40% reduction in drinking water supplies. Also, temperature changes may give invasive alien species a competitive advantage. The absence of the Plan is not expected to affect this trend.

In the absence of the Plan there will be no development at SFPC facilities and there is also unlikely to be any significant amount of development in the study area. The SFPC would be a major catalyst for the development of new material assets in the region, being the main source for imported materials and a hub for industry in the area. Without the development and implementation of Vision 2041 it is unlikely that the region would be able to tap into the greatly anticipated offshore and onshore renewable energy work in the area, which is seen by many as the future for many industries in Ireland. If SFPC facilities are unable to compete with similar facilities throughout Ireland there would likely be the potential for job losses throughout the study area.

In the absence of the Plan there is the potential for two cultural heritage features not to be re-developed, being Bannatyne Mill and Sailors House, both of which are on the Limerick City Register of Protected Structures. Re-use of cultural, architectural and archaeological features can often be the best method of preservation, provided these features are sympathetically restored.

MITIGATION AND MONITORING

A number of mitigation measures for potential impacts of implementing Vision 2041 with the available Alternatives have been established for both the SEA and AA. Some of these options will have permanent residual impacts, due to development footprint, that cannot be mitigated for unless SFPC create new areas of equal habitat for each area of habitat that is lost. However the potential for this is not included within the Vision 2041 plan.

Article 10 of the SEA Directive requires that monitoring should be carried out in order to identify at an early stage any unforeseen adverse effects due to implementation of Vision 2041, with the view to taking remedial action where adverse effects are identified through monitoring. A monitoring programme is developed based on the indicators selected to track progress towards achieving strategic environmental objectives and reaching targets, enabling positive and negative impacts on the environment to be measured. The environmental indicators have been developed to show changes that would be attributable to implementation of the Plan.

NEXT STEPS

The next step in the SEA and Plan process will be a consultation period, where by Vision 2041, SEA and NIR will be assessed by the relevant environmental authorities, and a public and non-statutory consultation exercise will commence. Comments on the Plan, SEA and NIR are welcomed throughout this period, so that improvements can be made to the Plan or environmental assessments.

1 INTRODUCTION

1.1 SHANNON FOYNES PORT COMPANY

Shannon Foynes Port Company (SFPC) facilitates an international gateway on the Shannon Estuary that is recognised at a national level as being fundamental to Ireland's economic prosperity and global trading links. With six main facilities and commercial jurisdiction over marine activities on a 500 km^2 area on the Shannon Estuary, SFPC is Ireland's largest bulk port and second largest port based on tonnage. The Port of Foynes and the Port of Limerick (Limerick Docks) are the two main generalized cargo handling facilities owned and operated by SFPC. The other four facilities on the Shannon Estuary include Tarbet, Moneypoint, Aughinish and Shannon Airport. The locations of the Shannon Foynes Port Company facilities are shown in **Figure 1.1**.

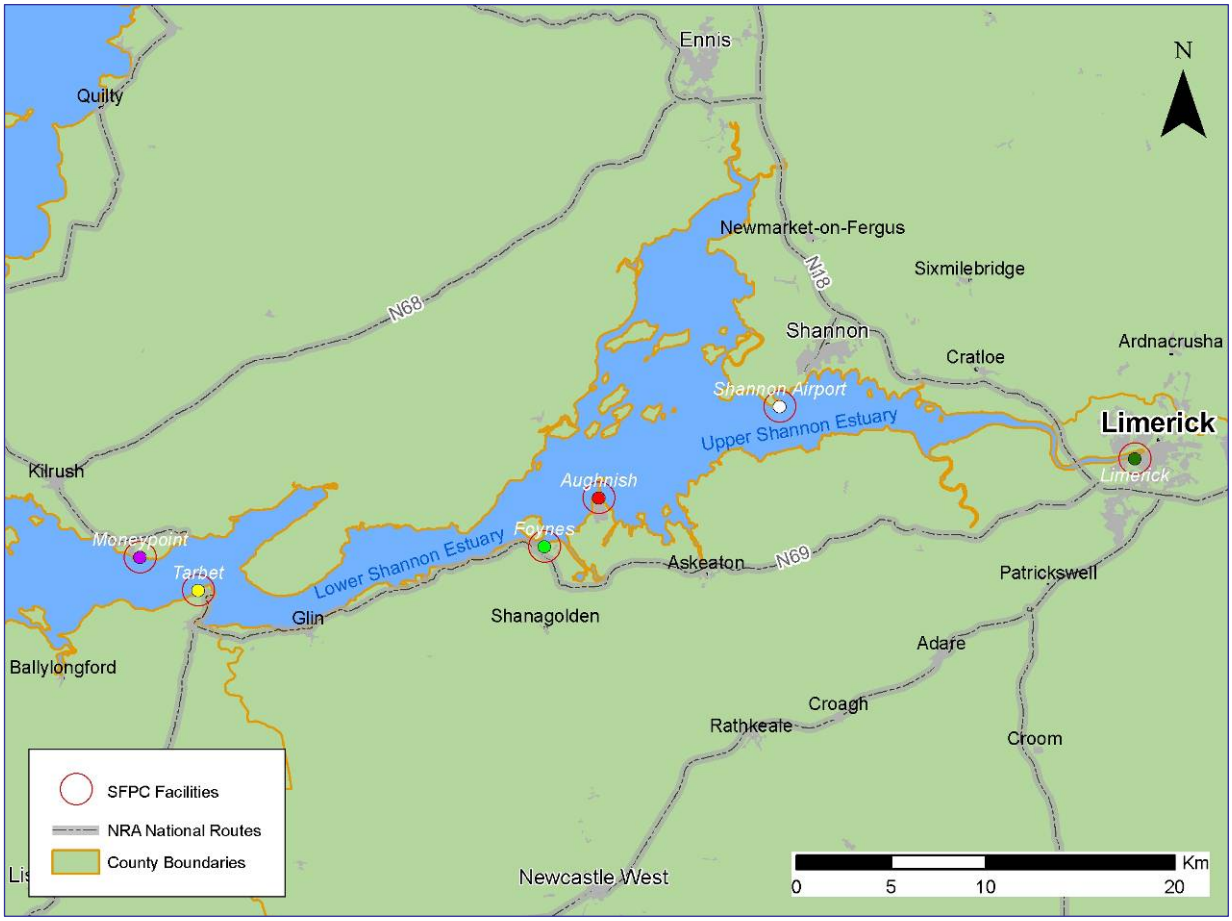


Figure 1.1: Shannon Foynes Port Company Facilities Location Map

SFPC is a limited company with the Irish State as sole shareholder, and has a fully independent commercial mandate. Headquartered in Foynes, SFPC is a major bulks deepwater port catering for liquid bulk, dry bulk and break bulk. SFPC was established from the merger of the former Shannon Estuary and Foynes port companies as part of the ports rationalisation and modernisation programme undertaken by the Irish government in 2000. SFPC handles the largest vessels entering Irish waters, which are up to 225,000 dead weight tonnes and handled 10.1 million tonnes of cargo in 2011 and 20% of total goods traded into and out of ports in Ireland in 2011.

1.2 SHANNON FOYNES HISTORY

Foynes Harbour was first identified and surveyed in 1837 as a potential port. Construction works commenced in 1846 and significant expansion continued through to the 20th Century. The inner port area of Foynes comprises of two distinct jetties including the western jetty and the eastern jetty. Originally partially constructed in 1968, followed by an extension in 1984, the existing berthage face at the eastern jetty is 296m, accessed via an existing viaduct. Planning permission was recently (2012) secured for a 2.5 hectare land reclamation project behind the jetty. The western jetty was originally constructed in 1934 and then completely upgraded and extended in 1998, with 271m of quayside berthage.

Rapid expansion of ***Limerick*** city and the docks occurred between 1750 and 1840 with the construction of the quays on the north and south sides of the river completed in 1840. A new dock was completed in 1853 and this was enhanced with a new dock gate and entrance, to facilitate the increasing size of vessels in 1955.

The jetty at ***Tarbert*** was commissioned in 1969 to serve the oil-fuelled power station constructed there. The ***Moneypoint*** terminal was established as a dedicated facility for coal, used to fuel the ESB-owned generating station on site, which went into full production during 1987. The jetty at ***Aughinish*** Island is provided for bauxite and alumina cargoes and was constructed to serve the alumina producing plant which went into production in 1983. Finally the ***Shannon Airport*** facility was commissioned in 1973 to service aviation fuel imports.

1.3 VISION 2041

Ireland's national ports policy (The Ports Policy Statement 2005 and the Ports Policy Review Consultation Document 2010) recognises the crucial role ports will play in facilitating future economic growth. While the most recent analysis pushes out the timeline within which substantial additional port capacity will actually be required, it is nationally recognised that new capacity will be required in the medium to long term, and this needs to be planned for now.

National ports policy supports a market driven approach to port investment and acknowledges that commercial port operators are best placed to make decisions about such investments. Whilst the role of ports policy is to create an environment in which such investment is facilitated and encouraged, the ports policy encourages ports to generate viable port capacity projects to ensure the availability of adequate modern facilities and to promote competition between ports. The European Commission's Communication on a European Ports Policy notes that ports should be ruled by long term strategic vision and planning. Furthermore, port master planning is recognised in national ports policy as a transparent method of aiding the engagement of local communities in the long term planning of ports. Therefore, best practise would indicate that a strategic vision for ports should be prepared to frame and guide future port development.

Vision 2041 is a non-statutory document that has been framed within the context of EU, national, regional and local spatial and development policies and strategies. Vision 2041 provides an evidence based framework setting out the ports' future aspirations for the medium and long term. It concentrates on the intensification, expansion and management of SFPC operations and facilities and on the future possibility of accommodating development at other locations on the Shannon Estuary. It will be used to guide future specific proposals and to inform investors and policy makers of SFPCs approach in response to the strategic and national ports policy.

Vision 2041 encompasses the entire operational area of SFPC. This includes operational ports and other lands owned by or within the control of SFPC as well as the extent of the Shannon Estuary for which they also have responsibility for navigational safety.

The purpose of the SFPC's Vision 2041 is to:

- Clarify SFPC's strategic planning and vision for medium to long term port development;
- Ensure that the port and its infrastructure requirements remain at the heart of national, regional and local planning policy
- Inform port users and the local community of the Port Development Strategy;
- Attract future investment with a clear and concise development strategy;
- Establish a platform for future developments, which will reduce the lead time for individual projects; and
- Provide a clear understanding of the sensitive environment that comprises the Estuary.

1.4 STRATEGIC ENVIRONMENTAL ASSESSMENT

Strategic Environmental Assessment (SEA) is a process for evaluating, at the earliest appropriate stage, the environmental quality and consequences of Plans or Programmes. The purpose is to ensure that the environmental consequences of plans and programmes are assessed both during their preparation and prior to adoption. The SEA process also gives interested parties an opportunity to comment on the environmental consequences of implementing plans or programmes and to be kept informed during the decision making process.

The European Directive (2001/42/EC) on the Assessment of the Effects of Certain Plans and Programmes on the Environment (the SEA Directive), was transposed into national legislation in Ireland by the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (S.I. 435/2004) and the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (S.I. 436/2004). Further to the transposition of this Directive two amending regulations which were signed into Irish law on the 3rd of May 2011 (amending the original transposing regulations):

- **European Communities (Environmental Assessment of Certain Plans and Programmes) (Amendment) Regulations 2011**, (S.I. No. 200 of 2011), amending the *European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004* (S.I. No. 435 of 2004), and
- **Planning and Development (Strategic Environmental Assessment) (Amendment) Regulations 2011**, (S.I. No. 201 of 2011), amending the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (S.I. No. 436 of 2004).

The SEA process is comprised of the following steps:

- **Screening**: Decision on whether or not a SEA of a Plan/Programme is required;
- **Scoping**: Consultation with the defined statutory bodies on the scope and level of detail to be considered in the assessment;
- **Environmental Assessment**: An assessment of the likely significant impacts on the environment as a result of the Plan or Programme;
- An **Environmental Report**;
- **Consultation** on the draft Plan/Programme and associated Environmental Report;
- **Evaluation of the submissions** and observations made on the draft Plan/Programme and Environmental Report; and
- Issuance of a **SEA Statement** (identifying how environmental considerations and consultation have been integrated into the Final Plan/Programme).

Figure 1.2 shows the key steps required to complete the statutory SEA process in accordance with the relevant national legislation.

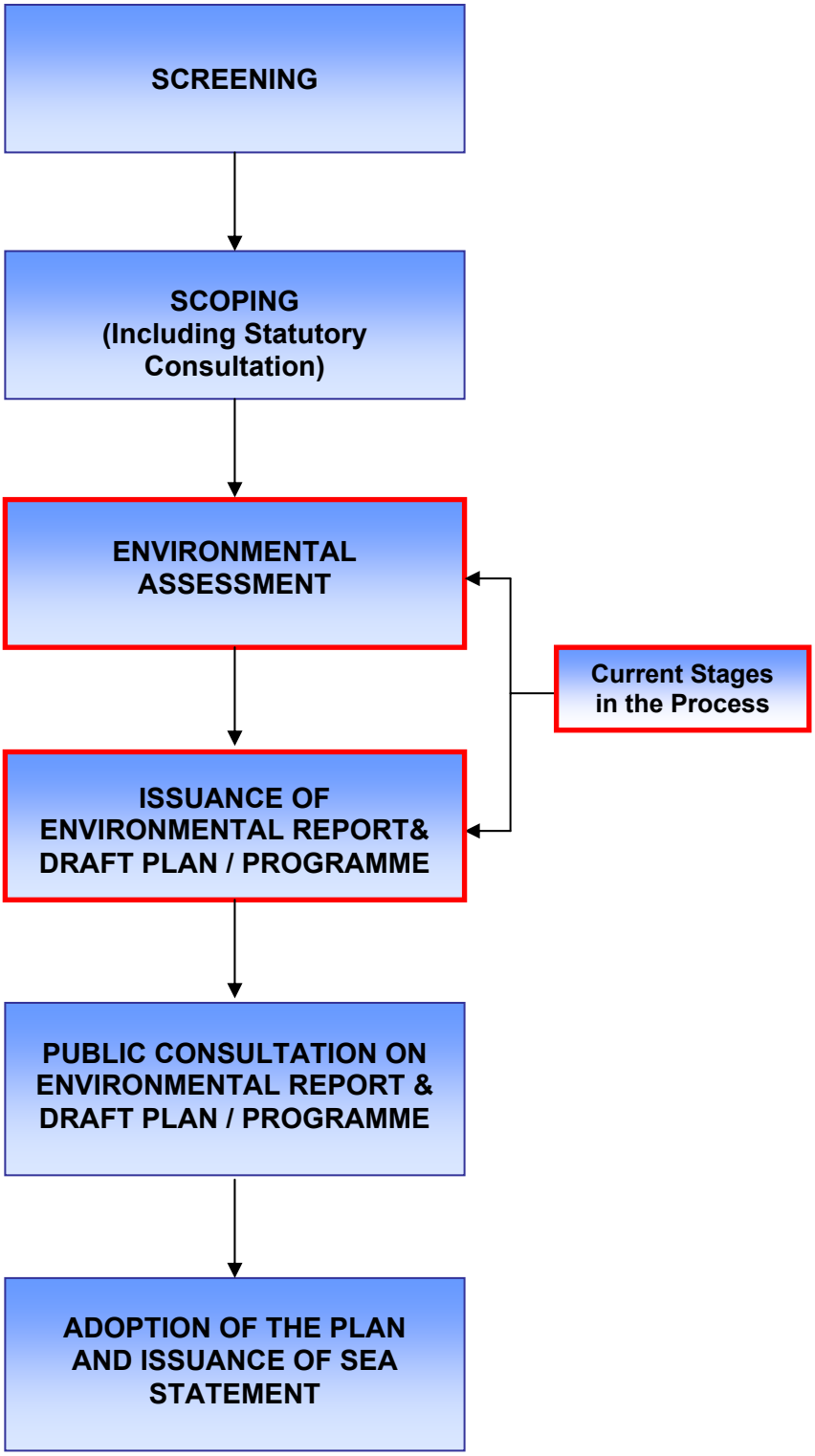


Figure 1.2: Overview of SEA Process

1.4.1 Requirement for a SEA

Screening determination letters with information on the SFPC Vision 2041 were sent to the Statutory Consultees on the 16th July 2012 acknowledging that SFPC would undertake a SEA of Vision 2041. Responses received from the agencies with regard to these letters are given in **Appendix A**.

The statutory consultees established within the legislation for Ireland are:

- Environmental Protection Agency (EPA);
- Department of Environment, Community and Local Government (DoECLG), and
- Department of Communications, Energy and Natural Resources (DCENR) (formerly DCMNR).

- Department of Agriculture, Food and the Marine (DAFM), and
- Department of Arts, Heritage and the Gaeltacht (DAHG)

This SEA for SFPC Vision 2041 is taking place in parallel to the overarching SEA for the Strategic Integrated Framework Plan (SIFP) SEA. The proposal of Vision 2041 and the findings of this SEA will be closely aligned with the findings of the SIFP and its associated SEA. As SFPC are a key stakeholder on the SIFP the jurisdiction of which covers the same geographical area as that of the SFPC Vision 2041. Much of the information arising from the SIFP and its associated Environmental Assessments will be directly applicable and will be utilised for the assessment of Vision 2041 in order to avoid duplication of effort.

1.4.2 Scoping

Under Article 6 of the SEA Directive, the competent authority (in this case SFPC) preparing the plan is required to consult with specific “environmental authorities” (statutory consultees) on the scope and level of detail of the information to be included in the Environmental Report. These statutory consultees are detailed above.

The main objective of this scoping process was to identify key issues of concern that should be addressed in the assessment of the Plan and the appropriate level of detail to which they should be considered.

The SEA Screening Determination letter of the 16th July 2012 to the statutory consultees included an initial scoping request to these authorities. One response was received with regards to scoping of the project, from the EPA, and this is included in **Appendix A**.

1.5 RESPONSIBLE AUTHORITIES FOR VISION 2041

This SEA is being carried out on behalf of the Shannon Foynes Port Company (SFPC), who are the responsible authority for the Port of Foynes and the Port of Limerick, the marine facilities at Tarbert, Moneypoint, Aughinish and Shannon Airport, and the commercial marine activities on a 500 km^2 area on the Shannon Estuary.

1.6 STUDY TEAM

The study team for the SEA of the SFPC Vision 2041 plan comprises of engineering, environmental and planning team members from both SFPC, RPS (Environmental and Engineering Consultancy) and HRA Planning (Chartered Town Planning and Consultants). Throughout the Plan, SEA and Appropriate Assessment (AA) processes, the relevant team members from have worked closely together, with constant contact and team meetings to ensure complete integration.

2 METHODOLOGY AND CONSULTATION

2.1 INTRODUCTION

The SEA Directive requires that certain Plans and Programmes, which are likely to have a significant impact on the environment, be subject to the SEA process. The SEA process is broadly comprised of the following steps:

SEA Step / Stage	Purpose	Status
Screening	Decision on whether or not an SEA of a Plan/Programme is required.	Completed mid Summer 2012 in consultation with the statutory authorities. A pre Screening meeting and discussions were undertaken withthe EPA.
Scoping	Consultation with the defined statutory bodies on the scope and level of detail to be considered in the assessment.	Completed mid Summer 2012 in parallel to the screening stage and consultation with the EPA.
Environmental Assessment	Assessment of the likely significant impacts on the environment as a result of the Plan or Programme culminating in the production of an Environmental Report.	Completed September 2012.
Consultation	Consultation on the draft Plan and associated Environmental Report.	This will take place in Autumn 2012.
SEA Statement	Identification of how environmental considerations and consultation have been integrated into the Final Plan culminating in the production of an SEA Statement.	To be published with Final Plan in late 2012.

2.2 GUIDANCE

The Environmental Report contains the findings of the assessment of the likely significant effects on the environment resulting from implementation of the proposed SFPC Vision 2041 plan. It reflects the requirements of the SEA Directive (2001/42/EC) on the assessment of the effects of certain plans and programmes on the environment and also the transposed regulations in Ireland (S.I. 435/2004).

Guidance which has been used during the overall SEA process and preparation of the Environmental Report can be found listed in **Appendix C**.

2.3 KEY STEPS IN SEA

2.3.1 Scoping

The objective of scoping is to identify key issues of concern that should be addressed in the environmental assessment of the Plan so that they can be considered in appropriate detail. Scoping also helps determine the boundaries of the assessment in terms of geographical extent and the time horizon for the assessment.

Scoping for the SEA was carried out in parallel with the screening determination for the SEA of Vision 2041. Comments received during the scoping process can be found in **Appendix A**.

2.3.1.1 DEFINING THE SCOPE

Table 2.1 provides a summary of the scope of the SEA.

Table 2.1 Scope of the SEA

Geographic Scope	SFPC Vision 2041 is limited to the development of SFPC facilities on the Shannon Estuary, namely the Port of Foynes, the Port of Limerick, and the marine facilities at Tarbet, Moneypoint, Aughinish and Shannon Airport. The development proposals in Vision 2041 primarily address potential development at Foynes and Limerick. To be prudent this SEA will take into account an area of 15km around all of the SFPC facilities, which will be referenced to as the study area. The extent of this study area can be seen in **Figure 2.1**.
Temporal Scope	Vision 2041 will be implemented with short, medium and long term goals for the development of facilities at the Port of Foynes and the Port of Limerick. In line with the SEA Directive, short, medium and long-term impacts of the Plan (including reference to secondary, cumulative, synergistic, permanent and temporary, positive and negative effects) will be considered during the assessment.
Scoping of SEA Environmental Topics	All of the environmental topics listed in the SEA Directive have been scoped in for the assessment of SFPC Vision 2041. These are: Biodiversity, Flora and Fauna Population Human Health Soil Landscape Water Air Climatic Factors Material Assets Cultural, Architectural and Archaeological Heritage

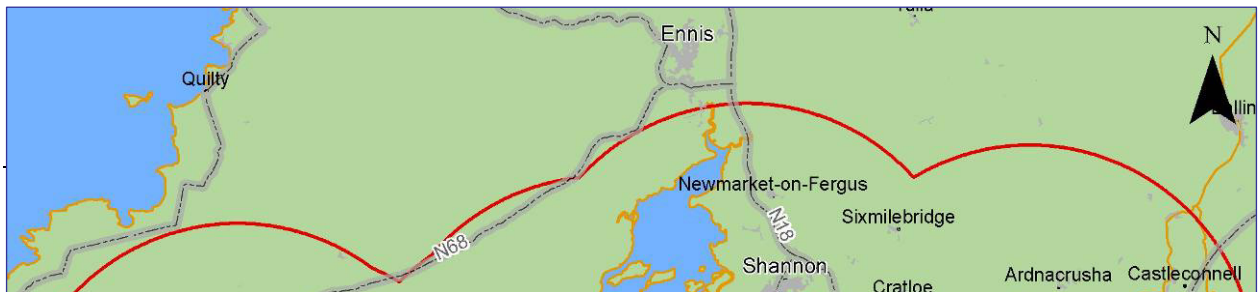


Figure 2.1: SEA Study Area

2.3.2 ENVIRONMENTAL ASSESSMENT AND ENVIRONMENTAL REPORT

2.3.2.1 Contents of the Environmental Report

Based on the legislation and guidance, the Environmental Report must include the information outlined in **Table 2.2**.

Table 2.2 Key Elements of the Environmental Report

Requirement of SEA Directive (Article 5(1), Annex 1)	Section of Environmental Report
An outline of the contents and main objectives of the plan or programme, or modification to a plan or programme, and relationship with other relevant plans or programmes;	3
The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme, or modification to a plan or programme,	4
The environmental characteristics of areas likely to be significantly affected	4
Any existing environmental problems which are relevant to the plan or programme, or modification to a plan or programme, including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to the Birds Directive or the Habitats Directive	4
The environmental protection objectives, established at international, European Union or national level, which are relevant to the plan or programme, or modification to a plan or programme, and the way those objectives and any environmental considerations have been taken into account during its preparation	4/5

Requirement of SEA Directive (Article 5(1), Annex 1)	Section of Environmental Report
The likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors	8
The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme, or modification to a plan or programme	9
An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information	7/8
A description of the measures envisaged concerning monitoring of the significant environmental effects of implementation of the plan or programme, or modification to a plan or programme	9
A non-technical summary of the information provided under the above headings	0

2.3.2.2 Environmental Assessment

The environmental assessment includes a combination of quantitative assessment, qualitative assessment and expert judgement. Quantitative assessment was not possible for all environmental issues; however, where possible, relevant quantitative data was used to ensure a robust assessment was carried out. **Table 2.3** outlines where quantitative assessment has been carried out.

Table 2.3 SEA Environmental Topics Suitable for Quantitative Assessment

Environmental Receptors	Is it Quantifiable?
Biodiversity, Flora and Fauna	Quantitative indicators may be suggested for this environmental aspect, e.g. % loss of habitat, number of EU designated sites impacted **Quantitative analysis carried out.**
Population / Human Health	Health impacts would primarily be secondary via emissions to air, water, soil, etc. There is no quantitative baseline data that could be usefully examined vis-à-vis Plan policies. However reference to emissions under the heading *Air Quality* may be useful. **Qualitative analysis carried out.**
Soil / Geology	Quantitative data may be available, e.g. potential area of development footprint. **Quantitative analysis carried out.**
Water	Some quantitative analysis possible, e.g. potential to affect water status. **Quantitative analysis carried out.**
Air / Climate	Some quantitative analysis possible with regards to changes in air quality due to increased traffic. **Quantitative analysis carried out.**
Material Assets	Some quantitative analysis possible, e.g. area of new development or number of new facilities proposed **Quantitative analysis carried out.**
Cultural, Architectural and Archaeological Heritage	Some quantitative analysis possible, e.g. number of monuments and listed buildings near proposed infrastructure locations. **Quantitative analysis carried out.**
Landscape	By its nature assessment of landscape and visual impacts is subjective. **Qualitative analysis carried out.**

2.3.3 SEA STATEMENT

The main purpose of the SEA Statement is to provide information on the decision-making process and to document how environmental considerations, i.e. the views of consultees and the recommendations of the Environmental Report, have been taken into account in the adopted SFPC Vision 2041 plan. The SEA Statement illustrates how decisions were taken, making the process more transparent.

The SEA Statement for SFPC Vision 2041 will be compiled after the statutory consultation on the draft Plan and SEA Environmental Report has been completed.

2.4 APPROPRIATE ASSESSMENT

The Natura 2000 network of European sites comprises Special Areas of Conservation (SACs, including candidate SACs) and Special Protection Areas (SPAs, including proposed SPAs). The obligation to undertake Appropriate Assessment (AA) derives from the Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora) obliging member states to protect and conserve the habitats and species of importance in a European Union context (Natura 2000). Article 6 is one of the most important articles of the Habitats Directive in determining the relationship between conservation and site use. Article 6(3) requires that “Any plan or

project not directly connected with or necessary to the conservation of a site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives."

An Appropriate Assessment of the SFPC Vision 2041 was carried out in parallel with the SEA process, with the findings of the AA used to guide the development of the alternatives and mitigation measures considered as part of the SEA. The output of the AA is a Natura Impact Report (NIR), which is available as a separate document. If the development proposals of Vision 2041 are progressed to the Project level another, more detailed, Appropriate Assessment may need to be carried out with project level information.

2.5 DIFFICULTIES AND DATA GAPS

The following difficulties and data gaps were encountered:

- Difficulties encountered due to the stage and timing of Vision 2041 and SEA in relation to the stage and timing of the overarching SIFP and its SEA.
- There is no published detailed Conservation Management Plan for the Lower River Shannon SAC or the River Shannon and River Fergus Estuaries SPA with which to assess the proposed development at SFPC facilities against.
- The late publication of the detailed Conservation Objectives and associated backing and supporting information on the qualifying interest features.
- The proposed extension to the Lower River Shannon and Fergus Estuaries SPA.

2.6 SCOPING CONSULTATION

To begin the process of scoping the SEA for the SFPC Vision 2041 plan an initial consultation was held with the EPA. Written comments received from the EPA during the Scoping Process are included in **Appendix A.** It was agreed with the EPA that this SEA should proceed even though the Shannon Integrated Framework Plan (SIFP) and its SEA are also currently in progress and will have the strategic authority over the SFPC Vision 2041 plan and SEA. The outcomes of the SIFP and its SEA have greatly influenced and informed the SFPC Vision 2041 plan and SEA.

2.7 TRANSBOUNDARY CONSULTATION

Under the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations (S.I. No 435 of 2004) transboundary consultations are required where the Plan is likely to have significant environmental effects on other Member States. Due to the geographical location of the SFPC activities it is extremely unlikely that Vision 2041 would have any transboundary

environmental impacts, and therefore no transboundary consultations were undertaken as part of the SEA process.

2.8 PROPOSED CONSULTATION ON DRAFT PLAN AND ENV REPORT

It is proposed that in autumn 2012 there will be joint statutory and public consultation on the draft SFPC Vision 2041 plan and the SEA Environmental Report for the Plan.

3 DESCRIPTION OF THE PLAN

3.1 INTRODUCTION

SFPC Vision 2041 has been developed in tandem with the SEA and subsequent environmental report. This SEA represents the documentation of the options/alternatives available to the Plan, the environmental assessment of these options/alternatives, and the environmental justification for the routing and site selection within the Plan.

3.2 SFPC VISION 2041

SFPC Vision 2041 has been prepared to meet a number of strategic objectives identified by SFPC, its customers and other interest groups as necessary to facilitate the effective operation of the Port in the period to 2041. The key objectives are set out below:

Port Functions

- Provide appropriate infrastructure and facilities to meet future demand and address the needs of existing and new customers.
- Optimise the use of existing port lands and reconfigure service facilities as required.
- Use new and developing technology to increase throughput to its maximum.
- Identify configurations for extending berthage and storage that mitigate impact on adjacent environmentally sensitive /designated areas.
- Provide adequate deep water berths to accommodate larger/deeper draught vessels in accordance with environmental /licencing requirements.

Awareness and Growth

- Utilise Vision 2041 as a framework for investment and growth based on SFPC's projected demand forecasts;
- Ensure that the port and its infrastructure requirements remain at the heart of national, regional and local planning policy;
- Inform port users and the local community of the Port Development Strategy;
- Attract future investment with a clear and concise development strategy.

Movement and Access

- Promote the provision of future transport infrastructure that facilitates shipping and related Port activities;
- Optimise internal port movements and traffic;
- Protect and promote the use of rail transport for goods to and from the Port of Foynes.

Environment and Heritage

- Ensure a development framework that is compatible with the adjoining areas with particular regard to areas on the Shannon Estuary which are designated under the Habitats Directive and the Birds Directive;
- Promote an ecosystem approach to port development;
- Integrate new development with the built and natural landscapes of the surrounding area;
- Secure the preservation of all Protected Structures within the Ports.

Integration with the Built Environment

- Enhance the general aesthetics / visual impact of port activities around the interface of Limerick and Foynes;
- Integrate port activities into the community and enhance visual linkages and connectivity.

Security

- Ensure that key areas of the Port retain good security provision in accordance with ISPS requirements.

Monitoring

- Monitor objectives and targets set out in Vision 2041;
- Identify a strategy for future review of Vision 2041against Port performance and business opportunities.

4 BASELINE ENVIRONMENTAL

4.1 INTRODUCTION

In line with the SEA Directive an environmental baseline is to be compiled for the SEA of the SFPC Vision 2041 plan. This will include: a description of the state of the environment at present; a discussion of the key problems / issues currently being faced in the area; and a description of the expected evolution of the environment should Vision 2041 not be implemented, i.e. in the absence of the plan.

4.2 CURRENT STATE OF THE ENVIRONMENT

Ireland's Environment 2012: An Assessment (EPA, 2012) describes the environment in Ireland as a strategic and valuable asset and as such it must be protected and proactively managed to ensure it forms the basis of Ireland's economic wellbeing and a healthy society. The overall finding of the report is that Ireland's environment remains in a good condition, although there are a number of areas of concern, and Ireland faces a number of key challenges in the coming years. The recent period of economic recession has lowered pressure on the environment in areas such as waste generation and greenhouse gas (GHG) emission. This period of recession has served to provide a small bit of breathing space for the environment in some sectors, as it had previously been reported in *2020 Vision – Protecting the Irish Environment* (EPA, 2007) that pressures on the environment had increased significantly, as Ireland's economy grew over the ten years leading up to the report the environmental pressures had accelerated at a rate that far exceeds that observed in other EU countries.

Ireland's Environment 2012: An Assessment (EPA, 2012) identified four priority challenges for the environment, which, if addressed successfully, should benefit the present and future quality of Ireland's environment. These comprise: Valuing and Protecting our Natural Environment; Building a Resource-Efficient, Low-Carbon Economy; Implementing Environmental Legislation; and Putting the Environment at the Centre of Our Decision Making. These challenges are summarised below in **Table 4.1**.

Table 4.1 EPA Ireland's Environment 2012: *An Assessment* Key Challenges

Challenges	Components	Relationship to Plan
Challenge 1: Valuing and Protecting our Natural Environment	A good environment is a critical component of high quality of life for future generations. Meeting the requirements of the Water Framework Directive (WFD) in protecting water resources in a changing climate. Maintaining clean air and healthy soil and protecting biodiversity and nature from further loss and damage.	Vision 2041 needs to consider the objectives and precepts of other existing Policies, Plans and Programmes, such as the Habitats Directive and Water Framework Directive to ensure that the issues addressed by these are brought forward into the overall planning process. Vision 2041 also needs to ensure sufficient natural environment protective policies are included within the Plan.

Challenges	Components	Relationship to Plan
Challenge 2: Building a Resource-Efficient, Low-Carbon Economy	Need to overcome recent economic downturn. Increasing scarcity and costs of fuels and resources. Opportunity to ensure future development is based on highly efficient processes and improved resource efficiency through waste prevention to efficient and renewable energy and investment to become a resource-efficient competitive economy. Protection from future economic shocks. Requirement to meet international climate change agreements targets and 2020 targets on GHG emissions.	Vision 2041 should: Promote climate change reduction measures, i.e. through waste reduction, renewable energy and sustainable practices. Take account of potential climate change impacts when developing policies and objectives to ensure that the Plan does not contribute to the impact of climate change. In addition the Plan should consider the impacts of climate change when applying land use zonings to areas that are vulnerable to these impacts e.g. flooding.
Challenge 3: Implementing Environmental Legislation	Compliance with International obligations with respect to water quality, air quality, GHG emissions and waste management. Role of the EPA and other regulators to ensure effective enforcement of environmental legislation at national and local levels. Prevent avoidable environmental damage, protect Ireland's reputation and green image, which is important to economic sectors, agri-food and tourism sectors.	Vision 2041 needs to be set in the context of the requirements of national and local level legislation in developing policies and objectives as well as EU and international obligations.
Challenge 4: Putting the Environment at the Centre of Our Decision Making	Achieving sustainable development and growth at national, regional and local levels. Need for clear leadership and co-ordinated efforts from Government and public bodies, business, industry, farmers and the public.	Vision 2041 needs to ensure that there is buy in from all levels of society and that environment is at the centre of decision making. Consideration of the objectives of other existing Policies, Plans and Programmes at a national, regional and local level will aid in addressing the challenge of reversing environmental degradation.

In *2020 Vision – Protecting the Irish Environment* (EPA, 2007) the EPA outlines six environmental goals which reflect on the main challenges identified in the State of the Environment reports as well as key issues at the global and EU level as reflected in the 6th Environmental Action Plan (EAP). These goals are:

- Limiting and adapting to climate change;
- Clean air;
- Protected waters;
- Protected soils and biodiversity;
- Sustainable use of natural resources, and
- Integration and enforcement.

These goals are identified as a means of realising the vision of protecting and improving Ireland's environment. Many of these goals are relevant to Vision 2041 as the Plan contains a blueprint for future development in particular at Foynes Port and Limerick Docks within the Shannon Estuary.within the Shannon Estuary.

4.2.1 Status of EU Protected Habitats and Species

There are two levels of species-protection in Ireland being European-level designations and National-level designations. At the National level the relevant legislation is the Wildlife Act 1976 and Wildlife (Amendment) Act 2000 which is implemented through several sets of Regulations. At the European-level the relevant Directives are the 'Habitats Directive' and the 'Birds Directive' which are also implemented in Ireland by detailed Regulations. A summary of the habitats and species covered by European Directives is given in **Table 4.2** below.

Table 4.2: Overview of the Habitats and Species Covered by EU Directives

Resource	EU Directive
Species of birds	Birds Directive, 79/409/EEC (listed in Annex I of that Directive and referred to in Article 4(2) of that Directive)
Species of plants and animals	Habitats Directive, 92/43/EEC (listed in Annex II and Annex IV)
Habitats of birds	Birds Directive, 79/409/EEC (listed in Annex I of that Directive and referred to in Article 4(2) of that Directive)
Habitats of plants and animals	Habitats Directive, 92/43/EEC (listed in Annex II of that Directive)
Natural habitats	Habitats Directive, 92/43/EEC (listed in Annex I of that Directive)
Breeding sites or resting places	Habitats Directive, 92/43/EEC (listed in Annex IV)

The Habitats and Birds Directives and The European Communities (Natural Habitats) Regulations 1997, act to transpose two European Commission Directives into Irish law: the 'Birds Directive' (1979) which relates to wild birds, and the 'Habitats Directive' (1992) which deals with habitats and animals. Species protection can be split into two categories, being species protected within designated Natura 2000 sites (SACs and SPAs), and species protected both inside and outside of these areas. The European Directives contain lists of plants and animals that are rare or declining on a European scale, listed separately in a range of 'Annexes'. In Ireland, this list includes 20 mammals, fish, amphibians and invertebrates, 21 birds and 5 plants. More than 10% of the Irish national territory is designated as proposed Special Area of Conservation (SAC) or Special Protection Area (SPA). Any plan or development project that may have an impact on a Natura 2000 site, whether inside the site boundaries or not, must undertake an 'Appropriate Assessment' in order to determine the significance of any effects on the species and habitats found within the site.

European Union Member states are required to report at 6-yearly intervals on the implementation of the Habitats Directive. As part of the implementation of this directive a first baseline assessment of the conservation status of habitats and species was completed as per Article 17 in 2008. In Ireland each assessment included an assessment of the range, habitat area, habitat structure and functions, species population estimates, area of suitable habitat for species and future prospects, and concludes with an overall verdict of "good-green", "inadequate-amber", or "bad-red" result for each element, combining to give an overall rating for the particular habitat or species. These assessments have been

derived following strict EU guidelines by National Parks and Wildlife Service (NPWS) scientific staff and ecological experts in the scientific community.

The favourable conservation status of species and habitats has been defined in the Regulations. Conservation status of a species can be considered favourable if:

- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future;
- Population dynamics data for the species indicate that it is maintaining itself on a long term basis as a viable component within its natural habitats; and
- There is, and will probably continue to be, a sufficiently large habitat for the species to maintain its population on a long-term basis.

The conservation status of a habitat can equally be considered favourable if:

- Its natural range, and the area it covers within that range, is stable or increasing;
- The structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist; and
- The conservation status of its typical species is favourable, as defined above.

4.3 BASELINE AND RELEVANT ENVIRONMENTAL PROBLEMS

4.3.1 Biodiversity, Flora and Fauna

Urban growth on the island of Ireland had been accelerating at a greater rate over the last decade as increased development expands city and town limits into the countryside. Artificial land cover throughout Ireland remains relatively low; however, the constant encroachment on natural habitats undoubtedly has an impact on natural flora, fauna and biodiversity.

In Ireland there are over 2,000 protected sites, these include Special Areas of Conservation (SAC), Special Protected Areas (SPA), Natural Heritage Areas (NHA) and RAMSAR sites. The study area contains significant areas designated as cSAC, SPA, pSPA, pNHA and NHA which demonstrates the important ecological status of the area. Of key importance is the direct location of the area of interest directly within the River Shannon and River Fergus SPA/pSPA and the Lower River Shannon cSAC two of the most important Natura 2000 designated sites in Ireland and therefore form two of the key areas of concern for this assessment. There are no UNESCO Sites, Ramsar Sites, National Parks or National Nature Reserves within the study area.

4.3.1.1 European Environmental Designations

Special Areas of Conservation (SAC) are protected under the European Union (EU) Habitats Directive (92/43/EEC) and Special Protection Areas (SPA) are designated under the EU Birds Directive

(79/409/EEC) and together these form the backbone of the Natura 2000 network. The Natura 2000 network of European sites comprises Special Areas of Conservation (SACs, including candidate SACs), and Special Protection Areas (SPAs, including proposed SPAs). SACs are selected for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). The Directive lists certain habitats and species that must be protected within SACs. Such habitats include raised bogs, blanket bogs, turloughs, sand dunes, machair (flat sandy plains on the north and west coasts), heaths, lakes, rivers, woodlands, estuaries and sea inlets. SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. The annexed habitats and species for which each site is selected correspond to the qualifying interests of the sites; from these the conservation objectives of the site are derived.

Including proposed and candidate sites there are 12 SAC's and 2 SPA's within the study area, i.e within 15km of SFPC facilities. These Natura 2000 sites are listed in **Table 4.3** and their locations are shown in **Figure 4.1**.

Table 4.3: Natura 2000 Sites in Study Area

Name	Site Code
Barrigone SAC	SAC000432
Tory Hill SAC	SAC000439
Glenomra Wood SAC	SAC001013
Newhall and Edenvale Complex SAC	SAC002091
Lower River Shannon SAC	SAC002165
Askeaton Fen Complex SAC	SAC002279
Moanveanlagh Bog SAC	SAC002351
Tullaher Lough and Bog SAC	SAC002343
Knockanira House SAC	SAC002318
Ratty River Cave SAC	SAC002316
Curraghchase Woods SAC	SAC000174
Lough Gash Turlough SAC	SAC000051
River Shannon and River Fergus Estuaries SPA	SPA004077
Stack's to Mullaghareeirk Mountains, West Limerick Hills and Mount Eagle SPA	SPA004161

The previously mentioned River Shannon and River Fergus SPA/pSPA (SPA004077) and the Lower River Shannon cSAC (SAC02165) would be the Natura 2000 sites that SPFC facilities are directly in or adjacent to. These sites are therefore those most likely to be impacted upon by any development or operations from the SFPC facilities. The River Shannon and River Fergus SPA/pSPA is a designated site as it supports over

wintering birds and internationally important numbers of Dunlin, Black-tailed Godwit and Redshank. In addition, there are 16 species that have populations of national importance and for several of the bird species this is the top site in the country. Also of note is that three of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, being Whooper Swan, Golden Plover and Bar-tailed Godwit. The Lower River Shannon cSAC is selected for the following species listed on Annex II of the Habitats Directive – Bottle-nosed Dolphin (*Tursiops enewable*), Sea Lamprey (*Petromyzon marinus*), River Lamprey (*Lampetra fluviatilis*), Brook Lamprey (*Lampetra planeri*), Freshwater Pearl Mussel (*Margaritifera margaritifera*), Atlantic Salmon (*Salmo salar*) and Otter (*Lutra Lutra*). The site is also selected for floating river vegetation, estuaries, tidal mudflats, Atlantic salt meadows, Mediterranean salt meadows, *Salicornia* mudflats, sand banks, perennial vegetation of stony banks, vegetated sea cliff, reefs and large shallow inlets and bays all habitats listed on Annex I of the Habitats Directive.

4.3.1.2 National Environmental Designations

The Wildlife (Amendment) Act, 2000 provides the legal basis for the establishment of a national network of sites known as Natural Heritage Areas (NHAs). NHAs aim to conserve and protect nationally important plant and animal species and their habitats. NHAs are also designated to conserve and protect nationally important landforms, geological or geomorphilogical features. Planning authorities are obliged by law to ensure that these sites are protected and conserved. There are 5 designated NHAs and 25 potential NHAs (pNHAs) located within the study area. These national environmental designation areas are shown in **Figure 4.2**. All of the Natural Heritage Areas within the study area are peatlands which are located well away from all port facilities and are therefore unlikely to be impacted upon by Vision 2041. The main pNHAs which are closest to or overlapping SFPC facilities would be those most at risk of impacts from Plan developments and activities. These nearest pNHA sites are the Fergus Estuary and Inner Shannon - North Shore (002048), the Inner Shannon Estuary – South Shore (000435), Sturamus Island (001436), Barrigone (00432), Clonderalaw Bay (000027), Tarbert Bay (001386), Ballylongford Bay (001332), and Scattery Island (001911).

Figure 4.1: Natura 2000 Environmental Designations within Study Area

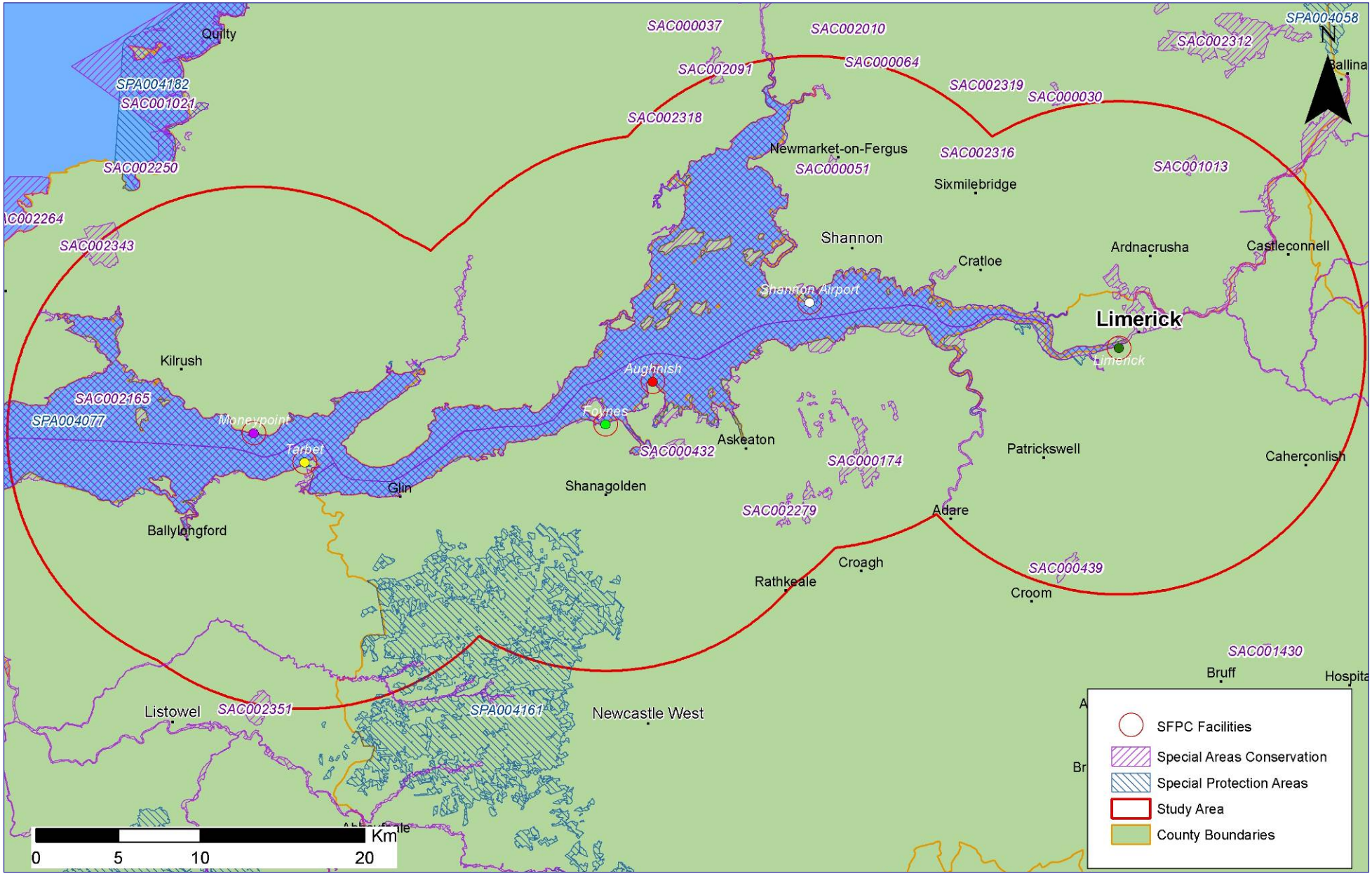
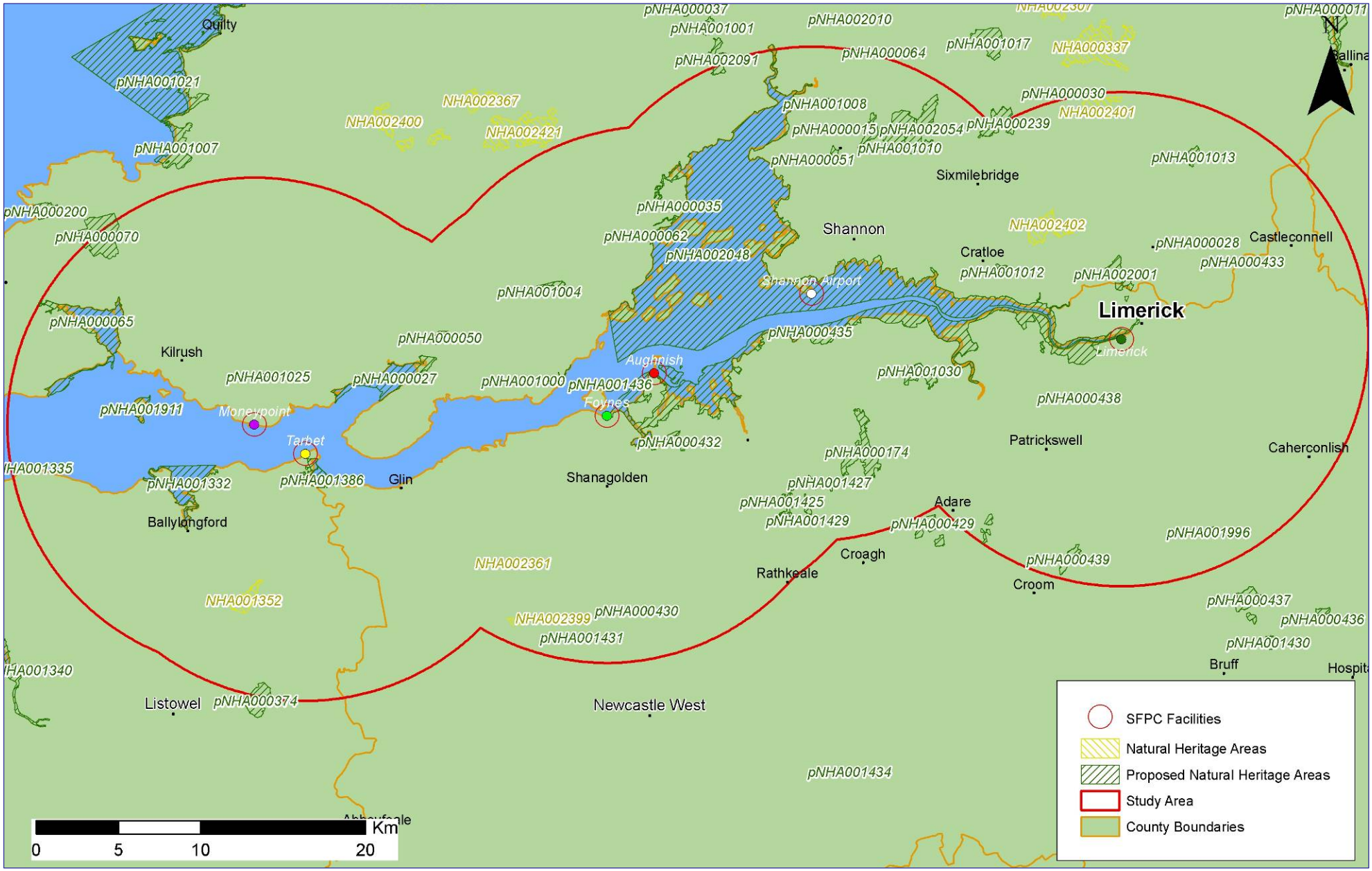


Figure 4.2: National Environmental Designations within Study Area



4.3.1.3 Wintering and Migratory Waterbirds

The Shannon Estuary is one of the most important sites in Ireland for wintering and migrating waterbirds, supporting 10 bird species in numbers of international importance and a further 13 bird species occurring in numbers of national importance (Crowe, 2005). As part of the Shannon Integrated Framework Plan (SIFP) process a comprehensive review of all available bird data was undertaken to identify all possible sources of bird data for the Shannon Estuary. BirdWatch Ireland, the National Parks and Wildlife Service and a number of local ornithologists familiar with the Shannon Estuary were consulted in relation to existing sources of bird data for the SIFP area of interest waterbird counts of the River Shannon and Fergus Estuaries (Co Clare, Limerick, Kerry) SPA undertaken in 2010-2011 (Cummins and Crowe, 2011) identified 66 sub-sites of importance to wintering and migratory waterbirds. More recently NPWS have produced their detailed Conservation Objectives for the River Shannon and River Fergus estuaries SPA, (September, 2012) which looks in detail at these sub-sites and the requirements of the qualifying features. These are discusses further in the Habitats Directive Assessment. Please refer to the Natura Impact Report for further details.

4.3.1.4 Bottle Nose Dolphins (*Tursiops truncates*)

The Shannon Estuary is one of the most important habitats in Ireland, if not Europe, for the bottlenose dolphin *Tursiops enewable*. It is the only site designated as a candidate Special Area of Conservation for bottlenose dolphins in Ireland and one of around twenty such sites designated throughout Europe for this species. Research on the Shannon dolphins started in 1993, when a feasibility study to assess the potential of commercial dolphin-watching was carried out (Berrow et al. 1996). This study provided the first information to show individual dolphins were resident and that it was an important calving area. A more detailed study from 1995-1998 confirmed these initial findings and estimated a population of around 120 dolphins used the estuary (Ingram 2000). Ingram and Rogan (2002) explored how dolphins used the estuary and suggested dolphins preferentially used areas with the greatest benthic slope and depth. This dolphin population in the Shannon is thought to be stable (Berrow et al. 2012). Bottlenose dolphins are not evenly distributed throughout the Shannon Estuary; however dolphin survey effort is restricted mainly to parts of the outer and middle estuary. The Shannon Dolphin and Wildlife Foundation (SDWF) have been monitoring dolphin tour boats in the estuary since 2000 and carrying out systematic and opportunistic transects since 1993. However, there is very little survey effort upriver of Tarbert, Co Kerry apart from Berrow (2009) but this was restricted to winter months.

The SDWF, in collaboration with the Galway-Mayo Institute of Technology, have been monitoring bottlenose dolphins in the estuary acoustically for many years. These studies show that there is a significant tidal and diel pattern to the occurrence of dolphins at these sites and there can be large differences in these patterns over relatively short distances. As part of the SIFP process, static acoustic monitoring of bottlenose dolphins at deep-water berths within the estuary was carried out. C-PODs were deployed in the Shannon Estuary SAC at four locations; Moneypoint, Foynes, Aughinish and Shannon Airport. The Static Acoustic Monitoring shows that bottlenose dolphins regularly use deep-water berths in the middle and inner estuary. Their occurrence is progressively less the further

upriver but is still significant even at Shannon Airport (21% days with detections). Please refer to the Natura Impact Report for further details in relation to the SAM undertaken as part of the SIFP process.

In order to objectively assess sites for their importance for bottlenose dolphins, and to assess those sites upriver with no survey data, a habitat scoring system was developed as part of the SIFP process. Three categories were used to score each 2.5 km^2 grid cell. Water depth, seabed slope and current were used as factors and weighted current speed slightly higher than depth or slope. From this assessment a total of six areas were found to be of high priority habitat; three of these were between Kilcedaun Point , Co Clare and Beal Bar, Co Kerry, one near Tarbert, Co Kerry off Kilkerrin Point and two adjacent to Foynes Island, Co Limerick and Cahircon, Co Clare. Intermediate habitats are spread out from Kilcloher Head, Co Clare upriver to Aughinish Island, Co Limerick and Kildysert, Co Clare and including Loop Head, Co Clare.

4.3.1.5 Freshwater Pearl Mussel (*Margaritifera margaritifera*)

The Freshwater Pearl Mussel (FPM) is a bivalve Mollusc. It is found in rivers with clean well oxygenated river beds which flow over granite or sandstone rock. They are a large bivalve often growing up to 140mm in length with an oval-shaped heavy black shell. They are filter feeders associated with Salmonid waters, but they require higher water quality than Salmonids. They have a complex life cycle with a fish host usually required during the larval stages. In Ireland, native salmon (*Salmo salar*) and trout (*Salmo trutta*) are used as hosts. The fish provides the essential step in the mussel's life cycle and adult mussels are an indicator of good clean water. There has been a considerable decline in species distribution and numbers throughout the island of Ireland with all designated populations currently at unfavourable conservation status. Within the study area there is one Freshwater Pearl Mussel SAC population for which the river catchment is protected. This is the Cloon river system which is located in County Clare on the north shore of the Shannon Estuary feeding into the estuary at its downstream end. In Ireland, regulations have been introduced (The European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009, S.I. No. 296 of 2009) which set objectives for FPM catchments. A requirement of these regulations is the production of sub-basin management plans for each of the 27 designated populations of FPM. Draft sub-basin plans have been prepared and are available for download at www.wfdireland.ie . The FPM sub-basin plans identify critical local pressures and impacts on the freshwater pearl mussel and provide possible measures for restoration to favourable conservation status. The Cloon is one of these 27 populations which is currently at unfavourable conservation status, therefore any future development at the SFPC facilities should ensure no further deterioration in habitat quality or condition or no further impacts to the Cloon population. **Figure 4.3** shows the location of the Cloon Freshwater Pearl Mussel catchment within the study area.

4.3.1.6 Fish and Fishing Activity

A range of different fishing activities take place in the Shannon Estuary. On occasions, large R.S.W (Refrigerated Sea Water) and polyvalent vessels pursue a pelagic fishery, targeting herring and sprat

in the estuary. Mackerel and scad are sometimes fished off Loop Head. These pelagic fisheries attract trawlers from Rossaveal, Castletownbere and Dingle and this activity normally takes place from October through to February/March. Whitefish trawlers from Fenit, Doonbeg and Rossaveal also visit the area. There are approximately eight licensed local boats which work mainly pots (crab, lobster and shrimp), gillnets, tanglenets and driftnets. Much of the fishing activity takes place outside of the main estuary area. The gillnets take mainly white □enewab, haddock, dogfish, black □enewab, cod and ling while the summer tanglenet fishery operates on monkfish, turbot and ray. Shrimp fishing takes place within the estuary during the late autumn and winter months. **Figure 4.3** shows the main fishing activity within the study area.

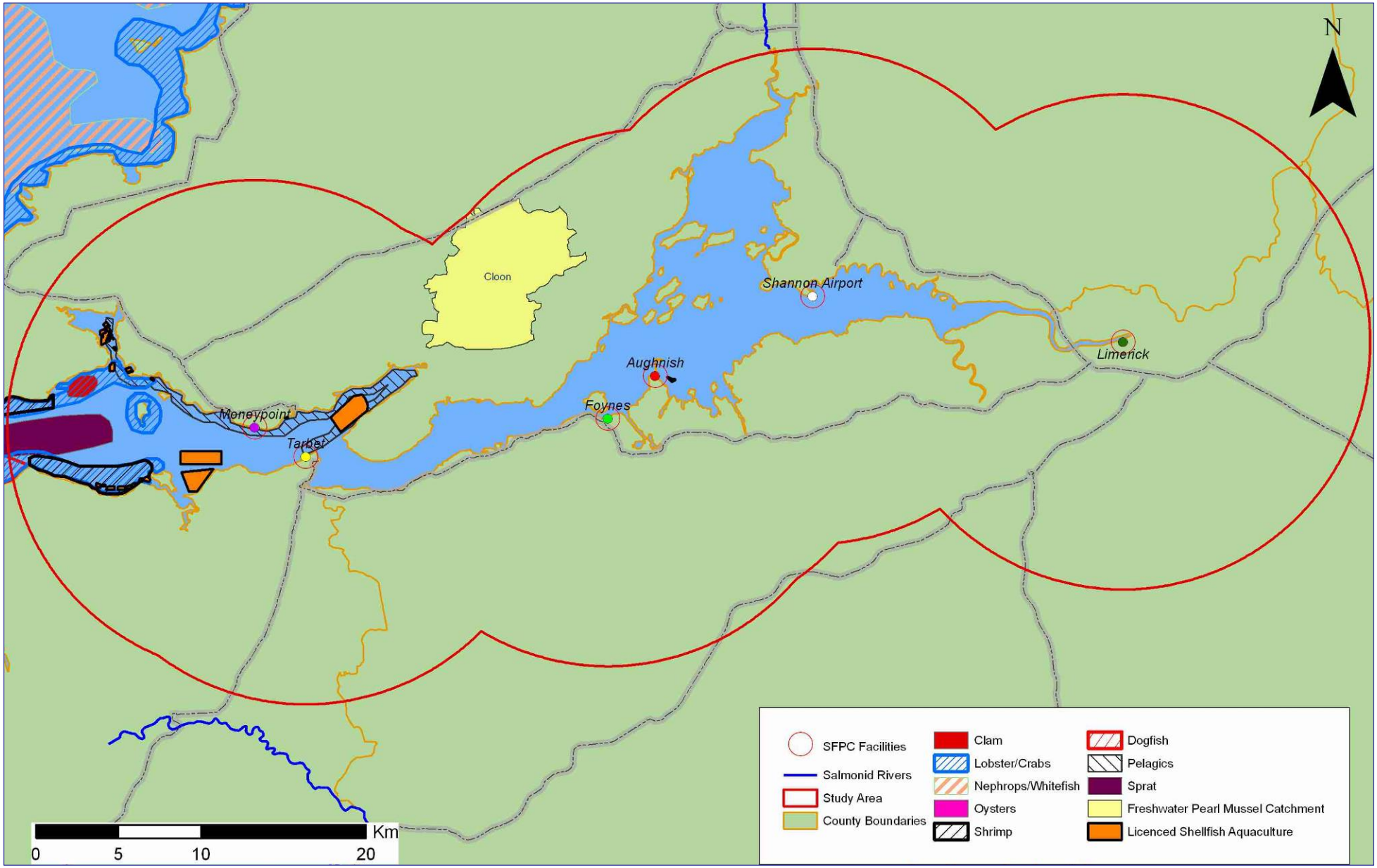
As the estuary is recognised as important for the commercial production of shellfish a number of areas have been designated under the Shellfish Water Directive, 2006/113/EC. These areas are within the study area and are Poulnasherry Bay, Clonderalaw Bay and Ballylongford Bay. Under this Directive, Pollution Reduction Programmes (PRPs) were developed which were signed by the Minister for Environment on January 19th, 2010. Implementation of the PRPs is monitored by the Water Quality Section of the Department of the Environment. The PRPs together with the associated Strategic Environmental Assessment of the PRPs for Waters Designated under the EU Shellfish Waters Directive in the Clare/Kerry Region will be referred to and applied as appropriate to the current SEA process.

The entire Shannon estuary is also important for a number of migratory fish species, some of which are protected under EU directives and have up and down stream migrations at various times throughout the year depending on the particular fish life stage. A summary of these fish species is shown in **Table 4.4.**

Table 4.4 Migratory fish species using the Shannon Estuary (Source: IFI)

Fish species	EU Status	Life Stages	Estuary transit
Atlantic salmon	Habitats – Annex II	Adult upstream migration	All times of year; "Spring" fish; grilse run in June- July
		Smolt downstream run	March –June
Sea lamprey	Habitats – Annex II	Upstream Adult spawning migration	April-July
		Seaward migration of young adults	Autumn – Winter
River Lamprey	Habitats – Annex II	Upstream Adult spawning migration	Autumn –Winter
		Seaward migration of young adults	Autumn – winter
Smelt	None	Adult upstream spawning migration	February – April
		Larval – young adult downstream migration	Post- spawning fradual downstream dispersal – April – August
Eel	EU Eel Action Plan	Upstream migration of elvers	
		Downstream of adult fish	Autumn

Figure 4.3: Freshwater Pearl Mussel Catchment and Fishing Activity in Study Area



4.3.1.7 Existing Environmental Pressures / Problems: Biodiversity, Flora and Fauna

Throughout Ireland there has been a decline in many of the native species through habitat loss, competition, development and agriculture, with 18 species of plant and animal identified as endangered and a further 52 recorded as vulnerable. The greatest single threat to biodiversity in Ireland is the removal of the habitats that plants and animals live in, such as woodland, grassland, hedges, rivers and lakes. At the moment this threat mainly comes from our approach to building new properties and roads, with these developments often cutting through and fragmenting habitats which are rich in biodiversity.

Industry often pollutes local water sources, fens and marshes are drained to use as farmland, and then this farmland is over fertilized and the excess nutrients are washed into the waterways upsetting the natural conditions of the river habitat. Each of these pressures may directly or indirectly impact on the biodiversity of water dependent habitats and species. Wastewater discharges, runoff from agriculture, leachate from landfills and contaminated sites and nutrient input from forestry can all have detrimental effects on water quality resulting in subsequent impacts to biodiversity.

Annex II species such as the freshwater pearl mussel and salmon are particularly sensitive to pollution. *Margaritifera* requires extremely oligotrophic conditions, preferably rivers with a biotic quality index of Q5 (Ireland). The EPA use the Q5, to indicate the highest quality status categories. Salmon need very good water quality typical of that found in upland streams. The species needs pool, glide and riffle so there is a requirement for rivers where dredging is not on-going and there are no abrupt changes to the current patterns as might occur through physical modifications.

Invasive plant and animal species are also a serious threat to biodiversity in Ireland. Invasive alien species negatively impact Irish biodiversity through competition, herbivory, predation, habitat alteration, introduction of parasites or pathogens, and potential genetic alteration of native species. Terrestrial and aquatic habitats can be negatively affected, resulting in severe damage to conservation and economic interests, such as agriculture, fisheries, forestry and various recreational activities. Alien species are non-indigenous invasive flora and fauna, which threaten the native ecology of the Lower Shannon by competing for habitats and / or food. Two species of concern are present in the greater Shannon; the Zebra Mussel has been found throughout the River Shannon and its main lakes. Dace is also present in the sub-catchments of the Shannon estuary. Invasive non-native plant and animal species are the second greatest threat to biodiversity worldwide after habitat destruction. They can negatively impact on native species, can transform habitats and threaten whole ecosystems causing serious problems to the environment and the economy. The spread of invasive non-native species is an existing problem within the Lower Shannon Estuary, e.g. *Spartina* species and hybrids, Giant Hogweed *(Heracleum mantegazzianum),* Japanese knotweed *(Fallopia japonica)* and Himalayan balsam *(Impatiens glandulifera).* Recent discoveries of the Asian Clam in Lough Derg is also cause for concern as experience from other invaded waterways suggests that in Lough Derg, this

highly invasive species could form dense infestations of up to 10,000 individuals or more per square metre, which may completely cover large areas of the lake bottom in a thick layer of clams up to 15cm deep. It can also cause similar impacts to inflowing and out flowing rivers with the potential to spread downstream into the rivers of the estuary. In these river systems, dense Asian clam infestations have the potential to clog up any Atlantic salmon and brown trout spawning grounds. Marine Alien species of concern include *Didemnum* species (a species of invasive tunicate), Wireweed(*Sargassum muticum*), clubbed tunicate (*Styela clava*), the vase tunicate (*Ciona intestinalis*), wakame (*Undaria pinnatifida*), slipper limpet (*Crepidula enewable*), and the Asian rapa whelk (*Rapana venosa*).

4.3.2 Population and Human Health

The population of Ireland was over 4.5 million in 2011. This population is increasing at ever growing rates (up 8% since the 2006); however, the population densities are still low from a European perspective and the overall population still remains below that of the island in the early 19th century. Allthree counties associated with or having direct connectivity with the area of interest have relatively high populations with all counties experiencing an increasing from the 2006 census except for Limerick City which experienced a 5% drop from the 2006 census.

4.3.2.1 Population

Table 4.5 shows the population of each County within the area of interest, and demonstrates that during the intercensal periods of 2002 to 2006 and 2006 to 2011, all counties experienced population increases expect Limerick city. Within the study area there are approximately 211,600 inhabitants. The study area for this SEA overlaps very slightly into North Tipperary, however is very unlikely to have any impacts on this population, and therefore information from this area is not included in this assessment.

Table 4.5 Trends in Population in counties within area of interest

County	2002	2006	% Change 2002 – 2006	2011	% Change 2006 – 2011
Clare	103,277	110,950	7.4	116,885	5.3
Limerick	121,281	131,516	8.4	134,52	8.3
Kerry	132,527	139,835	5.5	145,048	3.7
Limerick City	54,023	59,790	-2.7	56,779	-5.0

4.3.2.2 Employment

Table 4.6 shows unemployment statistics for the study area taken from the latest census in April 2011 by the Central Statistics Office Ireland. This table presents the percentage of unemployed people in the region and in Ireland as a whole, including first time job seekers aged 15 year and over. The table shows that all counties within the study area are around the national average, while Limerick City is experiencing relatively high levels of unemployment, at 28.6% of the employable population being out

of work. In the recent census it was noted that out of 38 electoral divisions within Limerick City 17 of them are considered unemployment blackspots.

Table 4.6 Unemployment Levels – CSO 2011

Region	Unemployment Rate (%)
Ireland	19.0
Munster	18.6
Limerick (Total)	20.7
Limerick County	17.5
Limerick City	28.6
Kerry	19.5
Clare	18.8

4.3.2.3 Human Health – Drinking Water Quality

The European Communities (Drinking Water) Regulations (No. 2), 2007 came into force in March 2007. In accordance with these regulations, the local authority must notify the EPA where there has been a failure to meet a quality standard. **Table 4.6** shows the overall drinking water compliance rate within the various counties in the area of interest, as recorded in the EPA (2008) report, *The Provision and Quality of Drinking Water in Ireland, A Report on the Year 2010*.

Escherichia coli (*E. coli*), a bacteria that is an indicator of whether human or animal waste has entered a water supply, was detected during compliance monitoring on at least one occasion in 2.2% of public water supplies (20), continuing the downward trend of recent years. The incidence of *E. coli* in the larger public water supplies (i.e. serving > 5,000 persons) was 0.01% of samples. The number of private group water schemes where *E. coli* was detected dropped from 87 (17.0%) in 2009 to 56 (11.6%) in 2010. In general, the microbiological quality of private group water schemes remains inferior to public water supplies Chemical standard compliance in public water supplies was 99.2% in both 2009 and 2010.

Table 4.6 Drinking water quality compliance within the each county in the area of interest

County / City	Micro Compliance Rate	Chemical Compliance Rate	Reason for Non- Compliance
Clare	100%	99.1%	The 8 nickel non-compliances were caused by drinking water coming into contact with nickel plated tap fittings whilst the trihalomethanes non-compliances were primarily due to the chlorination of water with elevated levels of organic matter present.
Limerick (County)	100%	100%	1 trihalomethanes non-compliance was primarily due to the chlorination of water with elevated levels of organic matter present.

Limerick (City)	100%	99.8%	2 fluoride non-compliances were due to elevated levels of fluoride above the Irish standard. However, all samples were below the EU fluoride standard of 1.5 mg/l.
Kerry	99.7%	97%	The Microbiology was due to 3 E-Coli non- compliance and 64 trihalomethanes non-compliances were primarily due to the chlorination of water with elevated levels of organic matter present. The 4 fluoride non-compliances were due to elevated levels of fluoride above the Irish standard. However, all samples were below the EU fluoride standard of 1.5 mg/l.

Source: The Provision and Quality of Drinking Water in Ireland 2010

4.3.2.4 Human Health – Risk of Cryptosporidium Contamination

Cryptosporidium is a protozoal parasite that causes a diarrhoeal illness in humans. Both humans and animals are potential reservoirs. Surface water supplies with inadequate treatment (chlorination only) are at risk of failing to remove *Cryptosporidium* oocysts in the treatment process if present in the raw water. The EPA has required local authorities to carry out risk assessment on all water supplies in relation to *Cryptosporidium*. From this plants with very high and high risk have been identified. The results of this risk assessment process is guiding local authorities both in terms of their monitoring programmes and investment prioritisation under the Water Services Investment Programme. The use of turbidity meters on filtering systems has been a requirement of this programme from a monitoring perspective together with an increase in sampling and monitoring level. The EPA has also introduced the remedial action list (RAL) and this allows for the tracking of remedial action on plants identified as at higher risk from *Cryptosporidium*. A review of the counties within Ireland identified a number of plants in the area of interest as having risk of *Cryptosporidium* contamination, if they are not upgraded (EPA, 2011). A number have been upgraded and work is ongoing.

4.3.2.5 Human Health – Elevated Lead Levels in Drinking Water

A recent issue throughout several counties in Ireland has been the presence of elevated lead levels in drinking water. The permitted level of lead in drinking water is 25 micrograms per litre (due to reduce to 10 micrograms per litre in 2013), compared to some of the measured levels between 35 micrograms per litre to upwards of 80 micrograms per litre in some parts of Ireland. Older lead pipes are at this time thought to be responsible for the contamination due to lead being dissolved out of pipes bringing in mains water and internal plumbing in older homes.

Water supplies within the study area have been identified as having lead issues (EPA, 2008); these issues are currently being dealt with. The HSE, EPA and DOEHLG have since been developing a national strategy to deal with lead piping and measures to deal with this are anticipated. There has been a drop in the number of public water supplies where lead failures were notified to the EPA from 37 public water supplies in 2009 to 22 in 2010.

4.3.2.6 Human Health – Bathing Waters

Monitoring of water quality in the area of interest in designated bathing sites is carried out in accordance with the provisions of the European Council Directive concerning the quality of bathing water (76/160/EEC). The purpose of this directive is to ensure that bathing water quality is maintained, and if necessary improved, so that it complies with specified standards designed to protect public health and the environment. The water quality is good at the one bathing water located in the study area at Cappagh Pier, Kilrush.

4.3.2.7 Existing Environmental Pressures / Problems: Population and Human Health

Although currently in contraction, Ireland's economy experienced unprecedented economic growth since the early 1990's. Traditionally based around agriculture, particularly livestock farming, the economy became dominated by the services industry, with also large expansions in the construction, consumer and tourism sectors.

With this economic growth there came the significant amount of development of new individual houses and housing clusters, many of which were reliant on septic tanks, which can be a threat to water quality, and in the rush to construct more and more houses there was development on floodplains, which risks having adverse effects on both water quality and flood characteristics.

The increased population and household water usage have required bigger water supply schemes and produced larger volumes of wastewater to treat and dispose. Demand for more food and industrial goods has led to more intensive or expanded activities with higher water demand and pollution threats. Additional homes mean the spread of urban areas and an increase in rural housing, with the associated threat of more water pollution and greater surface water runoff without attenuation.

Pressure from abstractions can reduce flow in springs and lower water levels in lakes, wetlands and wells. This can make the water supply itself unsustainable and have an indirect impact on aquatic plants and animals as well as wetland areas. In extreme cases riverbeds may dry up, lakeshores can become exposed and, in coastal areas, salt water may intrude into groundwater. Drinking water supplies in the area of interest are currently under pressure, with a risk of shortages in urban, highly populated areas such as Limerick City.

4.3.3 Water

4.3.3.1 River Basin Districts and Water Bodies

Since 2000, the Water Framework Directive 2000/60/EC (WFD) has directed water management in the EU. The WFD requires that all Member States implement the necessary measures to prevent deterioration of the status of all waters (surface, ground, estuarine and coastal) and protect, enhance and restore all waters with the aim of achieving at least Good Ecological Status by 2015. All public bodies are also required to coordinate their policies and operations so as to achieve/ maintain Good Ecological Status of water bodies, within their jurisdiction in line with the relevant River Basin Management Plan and Programme of Measures.

The SFPC study area falls within the Shannon International River Basin District (ShIRBD) and as such much information regarding environmental baseline considerations, particularly water issues are identified in the SEA for the Water Framework Directive River Basin Management plans together with the SIFP environmental baseline. Additionally updated polices and management plans have been accessed and reviewed at www.wfdireland.ie. The RBDs take into account lakes, rivers, groundwater, transitional and coastal waters and information on their current status and existing pressures have been derived from the ShIRBD data base.

4.3.3.2 Register of Protected Areas

The WFD requires that Registers of Protected Areas (RPAs) are compiled for water bodies or parts of water bodies that must have extra controls on their quality by virtue of how their waters are used by people and by wildlife.

The WFD requires that these RPAs contain the following areas:

- Areas from which waters are taken for public or private water supply schemes;
- Designated shellfish production areas;
- Bathing waters;
- Areas which are affected by high levels of substances most commonly found in fertilisers, animal and human wastes – these areas are considered nutrient sensitive; and
- Areas designated for the protection of habitats or species, e.g. salmonid areas; Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

In Ireland, waters intended for human consumption are protected under the Drinking Water Regulations (2007). The actual protected areas for drinking water are not outlined within these Regulations, so the protected area for drinking waters is represented by the water body from which the water is abstracted, be it groundwater, a river or lake. There are eight protected drinking water rivers and three protected drinking water lakes within the study area, all of which however are well upstream of SFPC facilities and unlikely to be directly affected by SFPC activities. There are no Salmonid rivers within the study area, as shown previously in **Figure 4.3**. There is one designated bathing water within the study area, which is at Cappagh Pier, Kilrush.

4.3.3.3 Water Quality within the Shannon River Basin District

There are more than 1,600 lakes in the Shannon District but less than 50 of them are over 1km^2 in area. The largest lakes are Lough Derg (120km^2), Lough Ree (100km^2) and Lough Allen (30km^2), which are all on the River Shannon. The WFD reporting threshold for lakes is a minimum of 50

hectares in surface area or to be located in a protected area, and there are 49 in the Shannon IRBD which meet this threshold.

Marine waters in the Shannon IRBD account for approximately 1,500km^2. The entire coastline of the Shannon IRBD is in County Kerry and County Clare. There are numerous islands, headlands and inlets, many of which have estuaries and bays. There are 20 transitional waterbodies in the Shannon IRBD and 11 coastal waterbodies.

A new "water status" assessment approach was implemented on the island of Ireland as part of the WFD by the local authorities. The approach incorporates chemical and biological monitoring into a status grade for each waterbody. **Table 4.7** demonstrates the waterbody status as outlined in the Shannon River Basin Management Plan which was initially based on one year's monitoring data.

Table 4.7 Surface Water Status in the Shannon District

Surface Water Category	High	Good	Moderate	Poor	Bad	Unknown
Rivers and Canals % of total number of bodies	7.9	38.8	30.5	21.9	0.9	0.0
Lake (% of area)	1.5	13.4	78.4	1.1	0.5	5.2
Transitional (% of area)	0.0	91.2	8.8	0.0	0.0	0.0
Coastal (% of area)	97.7	2.3	0.0	0.0	0.0	0.0

*As of 01/12/2008

The majority of the waterbodies in the Shannon IRBD are within the good, moderate or poor classifications, with the exception of the coastal waterbodies almost all of which are of high status. Based on the current water status results, 53% of rivers, 85% of the lakes and 9% of the transitional waterbodies in the Shannon IRBD will need to have their status improved to meet the requirements of the WFD. All coastal waterbodies within the SHIRBD are meeting the requirements of the WFD.

4.3.3.4 Water Quality within the Study Area

The water quality status given below is given for the associated with or having direct connectivity with the area of interest, these are as follows: Clare, Limerick and Kerry. This gives a summary of the current river water quality for these counties. Since the writing of the River Basin Management Plans there has been a slight update to overall National status in 2011, the results of which were used to supply the summary below for each county. However these updated status results are not seen as affecting the formal legal status of waterbodies already reported by the River Basin Districts in the River Basin Management Plans.

Clare

- In Clare there are 159 river waterbodies- (28- High, 62- Good, 32- Moderate, 37- Poor), of which 57% are considered to be satisfactory (High or Good Status) and 43% are considered less than satisfactory (Moderate, Poor or Bad), as part of the WFD monitoring programme.

Limerick

- In Limerick there are 188 river waterbodies- (13- High, 75- Good, 41- Moderate, 58- Moderate, 1- Bad), of which 47% are considered to be satisfactory (High or Good Status) and 53% are considered less than satisfactory (Moderate, Poor or Bad), as part of the WFD monitoring programme.

Kerry

- In Kerry there are 547 river waterbodies (157- High, 222- Good, 148- Moderate, 18- Poor, 2- Bad), of which 69% are considered to be satisfactory (High or Good Status) and 31% are considered less than satisfactory (Moderate, Poor or Bad), as part of the WFD monitoring programme.

There are 141 waterbodies (including rivers, lakes, transitional and coastal) which intersect the study area. Of these 40% are considered to be satisfactory (High or Good Status), 58% are considered less than satisfactory (Moderate, Poor or Bad) and 2% have currently no status determined, these have all been classified as part of the WFD monitoring programme. A summary **Table 4.8** below gives the overall status of the waterbodies in this area, while **Figure 4.4** shows the location and status of these waterbodies.

Figure 4.4: Water Status in the Study Area (2011)

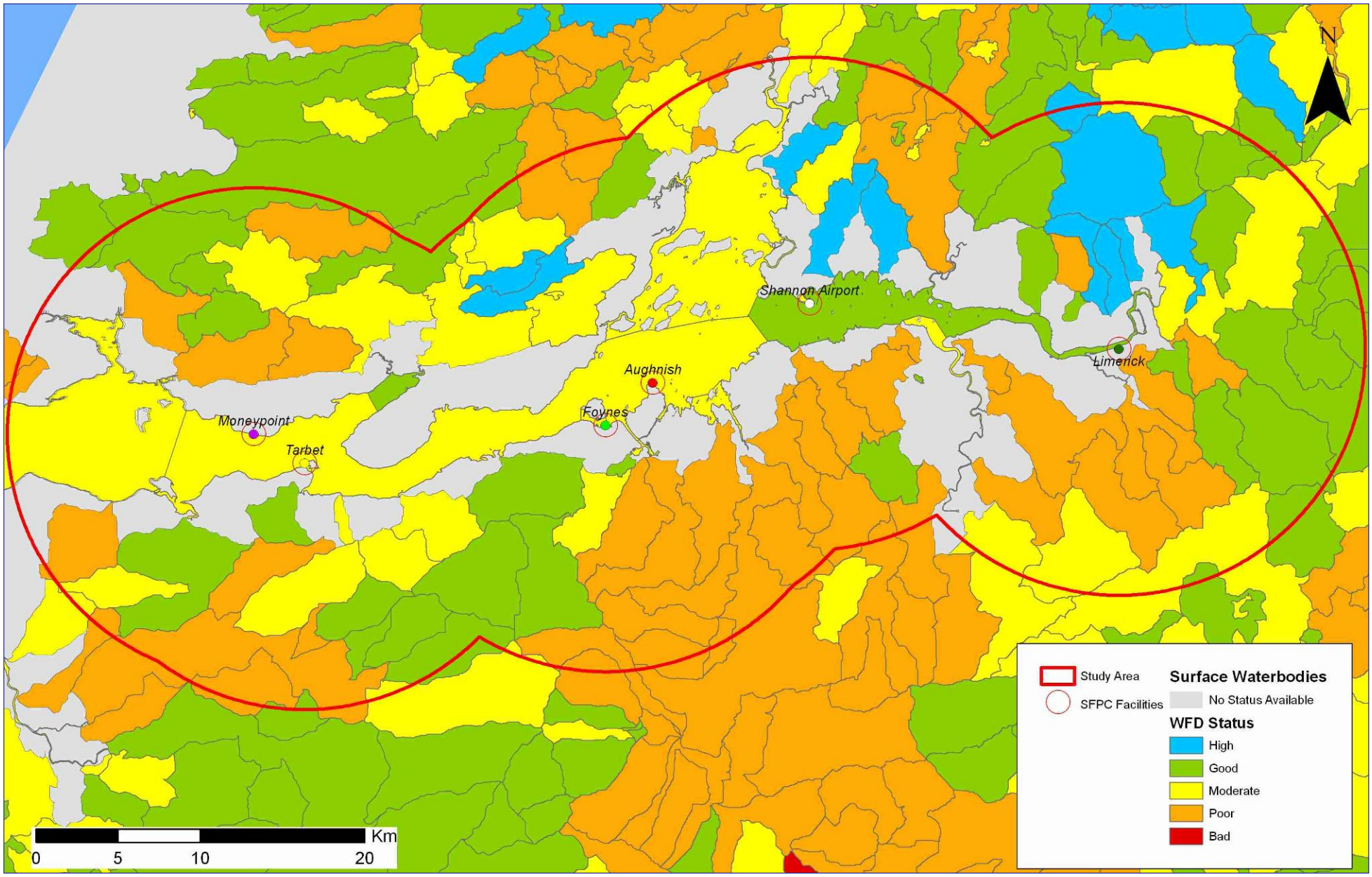


Table 4.8 Summary WFD Water Quality Status for the Area of Interest

Waterbody Code	Waterbody Type	NAME	Status 2011
SH_060_0000	COASTAL	Mouth of the Shannon (Has 23;27)	Moderate
SH_060_0300	TRANS	Lower Shannon Estuary	Moderate
SH_060_0350	TRANS	Foynes Harbour	Moderate
SH_060_0400	TRANS	Poulaweala Lough / Quayfield Lough	
SH_060_0600	TRANS	Deel Estuary	Moderate
SH_060_0700	TRANS	Maigue Estuary	Moderate
SH_060_0800	TRANS	Upper Shannon Estuary	Good
SH_060_0900	TRANS	Limerick Dock	Good
SH_060_1000	TRANS	Shannon Airport Lagoon	Moderate
SH_060_1100	TRANS	Fergus Estuary	Moderate
SH_060_1200	TRANS	Clonderalaw Bay	Good
SH_060_1300	COASTAL	Scattery Island Lagoon	
SH_23_2407	RIVERS	SH_Galey_Tyshe_1	Poor
SH_23_2467	RIVERS	SH_Galey_Knockfinnisk_1	Good
SH_23_2514	RIVERS	SH_Galey_GaleyMAIN_2Upper	Moderate
SH_23_2530	RIVERS	SH_Galey_MoyvaneMAIN_2Upper	Good
SH_23_2532	RIVERS	SH_Galey_MoyvaneMAIN_1Lower	Poor
SH_23_2745	RIVERS	SH_Feale_FealeTRIB_2Kilmeany	Good
SH_23_2752	RIVERS	SH_Galey_Douglas_1	Poor
SH_23_2767	RIVERS	SH_Galey_Pound_1	Moderate
SH_23_2927	RIVERS	SH_Feale_CashenTRIB_1Urlee	Moderate
SH_23_2929	RIVERS	SH_Galey_GaleyMAIN_1LowerMid	Poor
SH_23_2941	RIVERS	SH_Feale_FealeMAIN_1Lower	Good
SH_23_2949	RIVERS	SH_Feale_CashenTRIB_2Ballyegan	Poor
SH_23_813	RIVERS	SH_Galey_GaleyTRIB_5	Good
SH_23_997	RIVERS	SH_Galey_GaleyTRIB_5TRIB_1	Good
SH_24_1055	RIVERS	SH_ShannonEstuarySouth_ShanagoldenMAIN_1Lower	Good
SH_24_1070	RIVERS	SH_Deel_Kissaghatrodaun_1	Poor
SH_24_1075	RIVERS	SH_ShannonEstuarySouth_DeelTRIB_1TRIB_1MilltownLake	Poor
SH_24_1120	RIVERS	SH_Maigue_MaigueTRIB_5NagirraLough	Moderate
SH_24_1170	RIVERS	SH_ShannonEstuarySouth_Ahacronane_1	Poor
SH_24_1181	RIVERS	SH_ShannonEstuarySouth_BallylineMAIN_2Upper	Moderate
SH_24_124	RIVERS	SH_ShannonEstuarySouth_1Ballynacarriga	Poor
SH_24_1303	RIVERS	SH_Deel_SlewaunMAIN_2Upper	Poor
SH_24_1312	RIVERS	SH_Deel_SlewaunMAIN_1Lower	Poor
SH_24_134	RIVERS	SH_Maigue_Groody_1	Good
SH_24_1382	RIVERS	SH_ShannonEstuarySouth_1Glin	Moderate
SH_24_1392	RIVERS	SH_ShannonEstuarySouth_ShanagoldenTRIB_Shanid	Moderate
SH_24_1455	RIVERS	SH_Deel_SlewaunTRIB_1Kilscannell	Poor
SH_24_1548	RIVERS	SH_ShannonEstuarySouth_GlencorblyMAIN_1LowerMid	Moderate
SH_24_1577	RIVERS	SH_Maigue_CamogeTRIB_2GurLough	Good
SH_24_1605	RIVERS	SH_Deel_Daar_1	Poor
SH_24_1610	RIVERS	SH_ShannonEstuarySouth_Tarbert_1	Good
SH_24_1612	RIVERS	SH_ShannonEstuarySouth_BallylineMAIN_1LowerMid	Good
SH_24_162	RIVERS	SH_Maigue_GreanaghTRIB_2Croagh	Poor
SH_24_166	RIVERS	SH_ShannonEstuarySouth_Ahanload_1	Poor
SH_24_1670	RIVERS	SH_Deel_DeelMAIN_1LowerMid	Poor
SH_24_1673	RIVERS	SH_ShannonEstuarySouth_DeelTRIB_1AskeatonEast	Poor
SH_24_1675	RIVERS	SH_Maigue_MaigueMAIN_1Mid	Moderate

Waterbody Code	Waterbody Type	NAME	Status 2011
SH_24_1680	RIVERS	SH_Maigue_GreanaghMAIN_1Lower	Poor
SH_24_1688	RIVERS	SH_Maigue_MaigueTRIB_2AdareSouth	Poor
SH_24_1704	RIVERS	SH_Maigue_Barnakyle_1	Poor
SH_24_1712	RIVERS	SH_ShannonEstuarySouth_MaigueTRIB_1Carrig	Poor
SH_24_1718	RIVERS	SH_ShannonEstuarySouth_Ballynaclogh_1Main	Poor
SH_24_1720	RIVERS	SH_ShannonEstuarySouth_BallinacurraTRIB_1Limerick	Poor
SH_24_1726	RIVERS	SH_ShannonEstuarySouth_Lismakeery_1	Poor
SH_24_198	RIVERS	SH_Deel_DeelTRIB_1DoohyleLough	Poor
SH_24_254	RIVERS	SH_ShannonEstuarySouth_Washpool_1	Poor
SH_24_357	RIVERS	SH_ShannonEstuarySouth_1Astee	Poor
SH_24_382	RIVERS	SH_ShannonEstuarySouth_BarnakyleTRIB_1Roxborough	Poor
SH_24_50	RIVERS	SH_ShannonEstuarySouth_1Pallaskenry	Poor
SH_24_796	RIVERS	SH_Maigue_CamogeMAIN_1LowerMid	Moderate
SH_24_807	RIVERS	SH_Maigue_ClonshireFinshenaghMAIN_1Lower	Poor
SH_24_812	RIVERS	SH_Maigue_GreanaghTRIB_1AdareNorth	Good
SH_24_857	RIVERS	SH_ShannonEstuarySouth_WhiteTRIB_1Kilmoylan	Good
SH_24_87	RIVERS	SH_ShannonEstuarySouth_ShanagoldenMAIN_2MidUpper	Poor
SH_24_872	RIVERS	SH_Deel_DoallyMAIN_3Upper	Poor
SH_24_878	RIVERS	SH_ShannonEstuarySouth_WhiteMAIN_1Lower	Good
SH_24_886	RIVERS	SH_ShannonEstuarySouth_White_1	Good
SH_24_890	RIVERS	SH_ShannonEstuarySouth_GlencorblyMAIN_2Upper	Moderate
SH_24_90	LAKE	Bleach Lough	Good
SH_25_1163	RIVERS	SH_ShannonLower_BlackMAIN_2Upper	Good
SH_25_1202	RIVERS	SH_Mulkear_MulkearMAIN_1Lower	Good
SH_25_1222	RIVERS	SH_ShannonLower_GroodyTRIB_1Limerick	Good
SH_25_1981	RIVERS	SH_Mulkear_NewportTRIB_1Kilcomenty	Good
SH_25_2028	RIVERS	SH_Mulkear_KillengariffTRIB_1Clonkeen	Good
SH_25_2029	RIVERS	SH_Mulkear_AnnaghMAIN_1Lower	Good
SH_25_2045	RIVERS	SH_ShannonLower_GroodyTRIB_2Ballysimon	Good
SH_25_2822	RIVERS	SH_ShannonLower_GroodyMAIN_1Lower	Poor
SH_25_320	RIVERS	SH_Mulkear_NewportMAIN_1Lower	Good
SH_25_3209	RIVERS	SH_ShannonLower_BlackwaterClareMAIN_2Upper	High
SH_25_3221	RIVERS	SH_ShannonLower_Glenomra_1	Good
SH_25_3329	RIVERS	SH_ShannonLower_BlackwaterClareMAIN_1Lower	High
SH_25_3709	RIVERS	SH_ShannonLower_Shannon_3Kiltenanlea	Good
SH_25_3838	RIVERS	SH_ShannonLower_BlackMAIN_1Lower	Good
SH_25_3896	RIVERS	SH_ShannonLower_Shannon_1Ballycannan	High
SH_25_3900	RIVERS	SH_ShannonLower_Shannon_2Ballyglass	High
SH_25_3904_2	RIVERS	SH_ShannonLower_ShannonMAIN_2Lower	Moderate
SH_25_511	RIVERS	SH_Mulkear_Killengariff_1Main	Good
SH_25_513	RIVERS	SH_ShannonLower_GroodyMAIN_2Upper	Good
SH_27_1109	RIVERS	SH_ShannonEstuaryNorth_1Clooncoorha	Good
SH_27_1122_1	RIVERS	SH_Fergus_FergusMAIN_1Lower_pHMWB	Poor
SH_27_1147	RIVERS	SH_ShannonEstuaryNorth_1Clenagh	High
SH_27_1161	RIVERS	SH_ShannonEstuaryNorth_1Drumline	High
SH_27_120	LAKE	Rosroe Lough	Moderate
SH_27_1214	RIVERS	SH_Bunratty_OwenagarneyMAIN_2Upper	High
SH_27_122	LAKE	Gortglass Lough	Moderate
SH_27_1259	RIVERS	SH_ShannonEstuaryNorth_CrompaunMAIN_1Lower	Good
SH_27_127	LAKE	Finn Lough	Good
SH_27_1271	RIVERS	SH_Bunratty_Clovemill_1	Poor

Waterbody Code	Waterbody Type	NAME	Status 2011
SH_27_1273	RIVERS	SH_Bunratty_OwenagarneyMAIN_1LowerMid	Good
SH_27_1275	RIVERS	SH_Rine_RineMAIN_1Lower	Good
SH_27_1277	RIVERS	SH_Rine_LatoonCreekTRIB_1DooraPt	Moderate
SH_27_1279	RIVERS	SH_Fergus_Carrownanelly_1	Moderate
SH_27_1283	RIVERS	SH_Fergus_OwenslieveMAIN_1Lower	Good
SH_27_1289	RIVERS	SH_ShannonEstuaryNorth_1Killadysert	Moderate
SH_27_1292	RIVERS	SH_ShannonEstuaryNorth_CloonMAIN_1Lower	Moderate
SH_27_1294	RIVERS	SH_ShannonEstuaryNorth_1Kilmurry	Moderate
SH_27_1298	RIVERS	SH_ShannonEstuaryNorth_1Kilrush	Poor
SH_27_157	RIVERS	SH_ShannonEstuaryNorth_CrompaunTRIB_1Killeely	Poor
SH_27_193	LAKE	Ballycar Lough	Moderate
SH_27_206	RIVERS	SH_ShannonEstuaryNorth_DoonaghMAIN_1Lower	Poor
SH_27_217	RIVERS	SH_ShannonEstuaryNorth_CloonMAIN_2Mid	Moderate
SH_27_220	RIVERS	SH_Fergus_OwenslieveTRIB_1Clondagad	Poor
SH_27_258	RIVERS	SH_Fergus_ClareenMAIN_1Lower	Poor
SH_27_286	RIVERS	SH_Rine_RineTRIB_1CaherkineLough	Poor
SH_27_287	RIVERS	SH_Bunratty_Broadford_1	Moderate
SH_27_291	RIVERS	SH_Fergus_1Urlan	High
SH_27_351	RIVERS	SH_Rine_LiskennyMAIN_1Lower	Poor
SH_27_620	RIVERS	SH_ShannonEstuaryNorth_CrompaunMAIN_2Upper	High
SH_27_652	RIVERS	SH_Rine_Cullaun_1	Good
SH_27_662	RIVERS	SH_ShannonEstuaryNorth_CratloeCreek_1	Good
SH_27_682	RIVERS	SH_Fergus_ClareenMAIN_2Upper	Moderate
SH_27_692	RIVERS	SH_Fergus_ClareenTRIB_1Killone	Moderate
SH_27_735	RIVERS	SH_Fergus_OwenslieveMAIN_2Upper	Poor
SH_27_74	LAKE	Castle	Moderate
SH_27_749	RIVERS	SH_ShannonEstuaryNorth_DoonaghMAIN_2Upper	Poor
SH_27_88	RIVERS	SH_Fergus_1GashLough	Moderate
SH_27_885	RIVERS	SH_Bunratty_Gourna_1	Good
SH_27_892	RIVERS	SH_ShannonEstuaryNorth_CloonTRIB_2Kilfiddane	High
SH_27_897	RIVERS	SH_ShannonEstuaryNorth_CloonMAIN_3Upper	Moderate
SH_27_927	RIVERS	SH_ShannonEstuaryNorth_CloonTRIB_1Kildysert	High
SH_27_968	RIVERS	SH_ShannonEstuaryNorth_Wood_1	Poor
SH_27_974	RIVERS	SH_ShannonEstuaryNorth_1Knock	Poor
SH_28_346	RIVERS	SH_Doonbeg_DoonbegTRIB_1Clooncoorha	Good
SH_28_706	RIVERS	SH_Doonbeg_DoonbegMAIN_1Mid	Moderate
SH_28_709	RIVERS	SH_Creegh_Creegh_1Main	Good
SH_28_718	RIVERS	SH_Doonbeg_DoonbegTRIB_2Kilmahil	Poor
SH_28_733	RIVERS	SH_Doonbeg_DoonbegMAIN_3Upper	Good
SH_28_734	RIVERS	SH_Doonbeg_DoonbegMAIN_1Lower	Good
SH_28_848	RIVERS	SH_Coastal_1Knocknagore	Good

The objective of the Water Framework Directive is to ensure that all water bodies achieve “good” status. The main transitional and coastal waterbodies within the estuary vary from good to moderate status therefore those at good status should be maintained and those at moderate should aim to achieve at least good status by 2015. There are 58% of the river waterbodies in the area of interest that are unsatisfactory (less than good), so for these waterbodies improvements are also necessary. The River Basin Management Plans set out the measures being implemented to achieve the improvements to water quality. These include measures to control diffuse pollution such as

implementation of the Water Services Act in relation to septic tanks, Nitrates Regulations, control of forestry activities and control of point source pollutants by reviewing IPPC licences and water pollution licences etc.

4.3.3.5 Groundwater

Groundwater is an important source of drinking water but also makes an important contribution to river flows and lake levels. **Figure 4.5** shows the aquifer distribution in the study area, which identifies four groundwater body types, based on flow regime of the aquifer; which are poorly productive bedrock, productive fissured bedrock aquifers, gravel and karstic. The classification results in 60 groundwater bodies being identified within the study area. Poorly productive bedrock aquifers underlie approximately 40% of the study area, while Karstic aquifers underlie approximately a third of the study area. **Figure 4.6** demonstrates the groundwater vulnerability within the study area.

Groundwater status in the study area is given in **Table 4.9,** based on the new water status classification (2011), and this is shown graphically in **Figure 4.7**.

Table 4.9 Groundwater Status in the Study Area

Groundwater Status*	Good	Failing to Achieve Good
Chemical Status (% of total)	62	38
Quantitative Status (% of total)	100	0

*As of 2011

In the area of interest the groundwater status was found to be good for quantitative parameters; however only 62% of the groundwater body area achieved good chemical status. Over a third of the groundwater body area in the study area is therefore failing to achieve good chemical status under the WFD, and would require improvement.

4.3.3.6 Floods and Flooding

Flooding is a multi-functional natural process providing for flood attenuation and performing important ecological roles. Flooding is important in the context of the baseline data for the SEA of Vision 2041, as it is likely to act as a constraint on the development of some lands.

The Office of Public Works (OPW) was appointed as the lead agency for flood risk management in Ireland and is the national competent authority for the EU Directive on the assessment and management of flood risks [2007/60/EC], also referred to as the 'Floods' Directive. It is a framework directive that requires Member States to follow a certain process:

- Undertake a Preliminary Flood Risk Assessment (PFRA) by 22 December 2011, to identify areas of existing or foreseeable future potentially significant flood risk (referred to as 'Areas for Further Assessment, or 'AFA's);
- Prepare flood hazard and risk maps for the AFAs by 22 December 2013; and
- Prepare flood risk management plans by 22 December 2015, setting objectives for managing the flood risk within the AFAs and setting out a prioritised set of measures for achieving those objectives.

The National Catchment Flood Risk and Assessment (CFRAM) Programme was developed to meet the needs of the EU 'Floods' Directive and commenced in Ireland in 2011. The objectives of the CFRAM Studies are to:

- identify and map the existing and potential future flood hazard and risk areas within the Study Area;
- build the strategic information base necessary for making informed decisions in relation to managing flood risk;
- identify viable structural and non-structural measures and options for managing the flood risks for localised high-risk areas and within the catchment as a whole; and
- prepare (a) Catchment Flood Risk Management Plan(s) for the area, and associated Strategic Environmental Assessment, that sets out prioritised measures and policies, that should be pursued by the OPW, Local Authorities and other Stakeholders to achieve the most cost-effective and sustainable management of flood risk within the Study Area.

The CFRAM Programme comprises three main consultative stages:

- 2011 Preliminary Flood Risk Assessments (PFRA)
- 2013 Flood Hazard Mapping
- 2015 Flood Risk Management Plans

The PFRA has identified a number of key sites around the Shannon Estuary as Areas of Further Assessment (AFA) or Individual Risk Receptors (IRR).

Site	ID No.	RBD	County	Final Status
Askeaton	240365	Shannon	Limerick	AFA
Ballylongford	240370	Shannon	Kerry	AFA
Foynes	240383	Shannon	Limerick	AFA
Bunratty	270471	Shannon	Clare	AFA
Ennis	270474	Shannon	Clare	AFA

Kilrush	270476	Shannon	Clare	AFA
Limerick City & Environs	270477	Shannon	Limerick City	AFA
Shannon	270481	Shannon	Clare	AFA
1Power_Tarbert	240363	Shannon	Kerry	IRR
Shannon Airport	275484	Shannon	Clare	IRR

Areas of Further Assessment (AFA) are areas where, based on the Preliminary Flood Risk Assessment and the ShCFRAMS Flood Risk Review, the risks associated with flooding are potentially significant, and where further, more detailed assessment is required to determine the degree of flood risk, and develop measures to manage and reduce the flood risk.

The DoEHLG and OPW issued guidelines *'The Planning System and Flood Risk Management'*, in November 2009. The guidelines require that the assessment of flood risk is undertaken as part of the preparation and ongoing revision of development plans and local area plans, and that planning applications received following the publication of the guidelines must be accompanied by flood risk assessments where necessary. Under Section 28 of the 2000 Planning and Development Act, planning authorities and An Bord Pleanála are required to have proper regard to the principles and procedures of these guidelines in carrying out their functions. These guidelines have been adhered to during the preparation of the draft Plan.

In preparing and implementing Vision 2041, consideration should be given to the mechanisms and procedures required to ensure that the final Vision 2041 plan is reflected in the Shannon Catchment Flood Risk Assessment and Management Plan and equally that the Shannon CFRAM should be reflected in the proposals identified in the Vision 2041 plan.

To insure that impacts from development/change in land use practices (including flood plain development) do not cause interference with aquatic habitats, it is essential that those areas adjacent to the waterways (riparian buffer zones) are managed in a manner which will reduce impacts on these habitats. A riparian/buffer zone is a vegetated area near a water body, which helps shade and partially protect the water body from the impact of adjacent land uses.

It is a discrete ecological and geographical entity. It is the point of contact between the land (i.e. the terrestrial ecosystem) and the water body (i.e. the aquatic ecosystem). It plays a key role in protecting/improving water quality in associated water bodies (streams, rivers, estuaries and lakes), thus providing environmental benefits. With the decline of many aquatic ecosystems due to development riparian buffers have become an essential conservation measure aimed at improving water quality and lessening pollution impacts. The riparian/buffer zone must be sufficiently wide to protect the water body. Riparian buffers in addition to water quality benefits also provide habitat benefits in terms of directly providing habitat, providing shade, enhancing in-stream diversity (overhanging vegetation creates niches and supplies invertebrates and leaf-litter into the aquatic

zone). Riparian buffers also help mitigate habitat fragmentation by providing habitat connectivity i.e. as linear features in the landscape; riparian zones/woodlands can reduce fragmentation by connecting isolated habitats/woodlands, thereby creating greater structural diversity and critical mass.

Protection of aquatic zones can require riparian/buffer zones of up to 50m on both banks. The width of the riparian/buffer zone will depend on factors such as land use, land topography (e.g. slope), soil type, channel width/gradient and critical habitats to be protected.

The flood risk guidelines state that "Flooding is a natural process that can happen at any time in a wide variety of locations. Flooding from the sea and from rivers is probably best known but prolonged and intense rainfall can also cause serer flooding, overland flow and groundwater flooding. When it impacts on human activities, it can threaten people, their property and the environment. Assets at risk can include housing, transport and public service infrastructure, and commercial, industrial and agricultural enterprises. The health, social, economic and environmental impacts of flooding can be significant and have a wide community impact". The planning guidelines define flood hazard through the following zonal classification:

- Zone A – high probability of flooding: >1% probability for river flooding, >0.5% for coastal flooding;
- Zone B – Moderate probability of flooding: 1% to 0.1% probability for river flooding, 0.5% to 0.1% probability for coastal flooding, and
- Zone C – Low probability of flooding: <0.1% probability.

Limerick Docks

It should be noted that the Vision 2041 objectives for Limerick Docks (Sites 1-4) do not identify the requirement for significant expansion over the thirty year period of Vision 2041. It is envisaged that Limerick Docks will continue to provide a service to the Limerick Port users importing and exporting goods and facilitate new business as the demand arises. Whilst additional port infrastructure is not likely to be required in the short or long term there may be a need for additional warehousing, which could be adequately be accommodated on operating lands. Therefore, while the Limerick Docks sites are located within flood Zone A for which most types of development are considered inappropriate application of the justification test as objectives are brought forward may consider these developments appropriate.

Development within Flood Zone A should be avoided and/or only considered in exceptional circumstances, such as in town centres, or in the case of essential infrastructure that cannot be located elsewhere, and where the Justification Test has been applied. Only water-compatible development, such as docks and marinas, dockside activities that require a waterside location, amenity open space, outdoor sports and recreation, would be considered appropriate in this zone.

Based on the Preliminary Flood Risk assessment carried out by OPW, a considerable portion of Limerick Dock is subject to **risk** from coastal and fluvial flooding. It is anticipated that water compatible uses may be acceptable in these locations given the requirements outlined in Vision 2041 for this site are relatively low level with little requirement for alteration to current facilities quay walls and structures of importance which currently provide protection for this site. However, all proposals will be subject to a detailed flood risk assessment to identify the exact nature and extent of flood risk, and ensure they are developed and designed in accordance with the DoECLG and OPW Guidelines for Flooding and the Planning System. The assessment should include consideration of the existing flood embankments, future flood protection, climate change and sea level rise.

Foynes Port

Port Estate Expansion

The Port of Foynes has only 10 hectares of undeveloped/ unoccupied land remaining within its existing Port Estate. However this land is dispersed throughout the estate comprising three small parcels with the largest no greater than 7 hectares in area. Whilst this land could be used to accommodate the warehousing requirement detailed in the draft Plan, it is inadequate to meet the requirements of specialist projects related to renewable energy, industrial and/or the ocean energy sector.

In order to accommodate projected tonnage throughput it has been estimated that some 127 hectares of additional lands will be required to facilitate port operations up to 2040 (high growth scenario). In addition to the existing 10 hectares within the Port of Foynes, the Limerick County Development Plan has identified an additional 28 hectares of land for industrial use associated with the expansion of port activities. Excluding the existing zoned and undeveloped land in and adjoining the Port, there is still requirement for an additional 89 hectares of suitability zoned land required for industrial use / port related activities in an around the Port of Foynes.

While careful consideration must be given to the spatial location of such land particularly having regard to the provision of existing services and facilities including connection to the rail network.

The SIFP has identified as a strategic site the lands to the rear of Foynes Port. This Strategic Site is located on the edge of the Foynes Settlement, on lands to the rear of the Port of Foynes. The total site encompasses 151.8ha of land area

The land encompasses a small portion of land currently zoned within the Limerick County Development Plan for industrial related uses. The development accesses onto the main Port Access Road, as well as the N69 National Road Corridor.

Planning Designations

Ports are identified in the National Development Plan as a Regional Priority and as such are a key target for capital investment. This theme has filtered through the National Spatial Strategy, and has been embedded in the County Plan for Limerick and the Mid West Regional Guidelines. The Port

itself has been identified and zoned as industry within the County Plan, with an additional portion of undeveloped land has also been included. Objectives ED 05 outline and direct the industrial development potential of the Port, in terms of supporting its expansion, to cater for deep water berthage, and develop its potential as a strategic transport, energy and logistics hub.

Based on the Preliminary Flood Risk assessment carried out by OPW, a considerable portion of the site is subject to **risk** from coastal and fluvial flooding. It is anticipated that water compatible uses may be acceptable in these locations given the requirements outlined in Vision 2041 for this site are relatively low level with little requirement for alteration to current facilities quay walls and structures of importance such as the existing flood embankments along this site which currently provide flood protection. The requirements for this location will largely be storage and warehousing. However, all proposals will be subject to a detailed flood risk assessment to identify the exact nature and extent of flood risk, and ensure they are developed and designed in accordance with the DoECLG and OPW Guidelines for Flooding and the Planning System. The assessment should include consideration of the existing flood embankments, future flood protection, climate change and sea level rise.

Deep Water Berthage at Foynes Island

Following an initial preliminary assessment through the SFPC Vision 2041 process, Foynes Island has come to the fore as the preferred option from a navigational and capacity perspective. With extensive access to natural deep water (occurring between 12.5m to 20m depths), the island provides immediate access to the main navigation channel of the Estuary with no capital or maintenance dredging required. The Island has traditionally facilitated port operations. Until the late 1970's, an oil jetty was operational on the Island renewable a deep water berth which still exists on the north western side of the Island which was supported with infrastructural connections to the main port. This site has also been highlighted as a Strategic Site under the SIFP.

Based on the Preliminary Flood Risk assessment carried out by OPW, a considerably small portion or sliver of land on the western side of Foynes Island along the coastline is considered to have a low risk of coastal flooding. It has not been identified as an area requiring further investigation and is outside of of Flood Zone A. It is anticipated that water compatible uses will be acceptable on Foynes Island as the risk from flooding is very low. However, all proposals will be subject to a detailed flood risk assessment to identify the exact nature and extent of flood risk, and ensure they are developed and designed in accordance with the DoECLG and OPW Guidelines for Flooding and the Planning System. The assessment should include consideration of the existing flood embankments, future flood protection, climate change and sea level rise.

Justification Test

Notwithstanding the need for future development to avoid areas at risk of flooding, it is recognised that the existing urban structure of the country contains many well-established cities and urban centres, which will continue to be at risk of flooding this includes the location of many ports and docks which

are largely concentrated either within or adjacent to urban areas such as Limerick City and Foynes Village. At the same time such centres may also have been targeted for growth in the National Spatial Strategy, regional planning guidelines and the various city and county development plans taking account of historical patterns of development and their national and strategic value. In addition, development plans have identified various strategically located urban centres and particularly city and town centre areas whose continued growth and development is being encouraged in order to bring about compact and sustainable urban development and more balanced regional development. Furthermore, development plan guidelines, issued by the Minister for the Environment, Heritage and Local Government under Section 28 of the Planning and Development Act 2000, have underlined the importance of compact and sequential development of urban areas with a focus on town and city centre locations for major retailing and higher residential densities.

The Justification Test has been designed to rigorously assess the appropriateness, or otherwise, of particular developments that, for the reasons outlined above, are being considered in areas of moderate or high flood risk.

The Justification Test is an examination of such proposals against proper planning and sustainable development criteria and, if these are satisfied, against flood risk criteria to ensure that risks are reduced to an acceptable level and that flood risk is not increased elsewhere. The test is comprised of two processes.

1) Plan-making Justification Test
2) Development Management Justification Test

The first is the **Plan-making Justification Test** used at the plan preparation and adoption stage where it is intended to zone or otherwise designate land which is at moderate or high risk of flooding.

The second is the **Development Management Justification Test** used at the planning application stage where it is intended to develop land at moderate or high risk of flooding for uses or development vulnerable to flooding that would generally be inappropriate for that land.

Box 4.1 is a reproduction of Box 4.1 from the Planning Guidelines which specifies the three requirements that developments (land use zones) lying within the Flood Zones have to meet in order to pass the Justification Test.

Box 4.1: Justification Test for development plans

Where, as part of the preparation and adoption or variation and amendment of a development/local area plan[1], a planning authority is considering the future development of areas in an urban settlement that are at moderate or high risk of flooding, for uses or development vulnerable to flooding that would generally be inappropriate as set out in Table 3.2, all of the following criteria must be satisfied:

1 The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans as defined above or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act, 2000, as amended.

2 The zoning or designation of the lands for the particular use or development type is required to achieve the proper planning and sustainable development of the urban settlement and, in particular:

(i) Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement[2];

(ii) Comprises significant previously developed and/or under-utilised lands;

(iii) Is within or adjoining the core[3] of an established or designated urban settlement;

(iv) Will be essential in achieving compact and sustainable urban growth; and

(v) There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.

3 A flood risk assessment to an appropriate level of detail has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process, which demonstrates that flood risk to the development can be adequately managed and the use or development of the lands will not cause unacceptable adverse impacts elsewhere.

N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant flood risk assessment.

Box 4.1: Justification Test Requirements. (Source; Planning Guidelines)

Inappropriate development that does not meet the criteria of the Justification Test should not be considered at the plan-making stage or approved within the development management process.

	Flood Zone A	Flood Zone B	Flood Zone C
Highly vulnerable development (including essential infrastructure)	Justification Test	Justification Test	Appropriate
Less vulnerable development	Justification Test	Appropriate	Appropriate
Water-compatible development	Appropriate	Appropriate	Appropriate

Box 4.2: Matrix of Vulnerability versus Flood Zone to illustrate appropriate development and that required to meet the Justification Test. (Source; Planning Guidelines)

As per **Box 4.2** Water compatible development has been deemed appropriate in Flood Zone A. In terms of Limerick Dock and Port Estate Expansion at Foynes the objectives require potentially the addition of warehousing which comes under "Less vulnerable development" (**See Box 4.3**) therefore the justification test will be required for any future development or alteration in relation to warehousing at this site. Developments at Foynes Island are considered Water-compatible development and therefore are deemed appropriate at Foynes Island.

Vulnerability class	Land uses and types of development which include*:
Highly vulnerable development (including essential infrastructure)	Garda, ambulance and fire stations and command centres required to be operational during flooding; Hospitals; Emergency access and egress points; Schools; Dwelling houses, student halls of residence and hostels; Residential institutions such as residential care homes, children's homes and social services homes; Caravans and mobile home parks; Dwelling houses designed, constructed or adapted for the elderly or, other people with impaired mobility; and Essential infrastructure, such as primary transport and utilities distribution, including electricity generating power stations and sub-stations, water and sewage treatment, and potential significant sources of pollution (SEVESO sites, IPPC sites, etc.) in the event of flooding.
Less vulnerable development	Buildings used for: retail, leisure, warehousing, commercial, industrial and non-residential institutions; Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans; Land and buildings used for agriculture and forestry; Waste treatment (except landfill and hazardous waste); Mineral working and processing; and Local transport infrastructure.
Water-compatible development	Flood control infrastructure; Docks, marinas and wharves; Navigation facilities; Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location; Water-based recreation and tourism (excluding sleeping accommodation); Lifeguard and coastguard stations; Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms; and Essential ancillary sleeping or residential accommodation for staff required by uses in this category (subject to a specific warning and evacuation plan).
*Uses not listed here should be considered on their own merits	

Box 4.3: Classification of vulnerability of different types of development (Source; Planning Guidelines)

Figure 4.5: Aquifer Productivity within Study Area

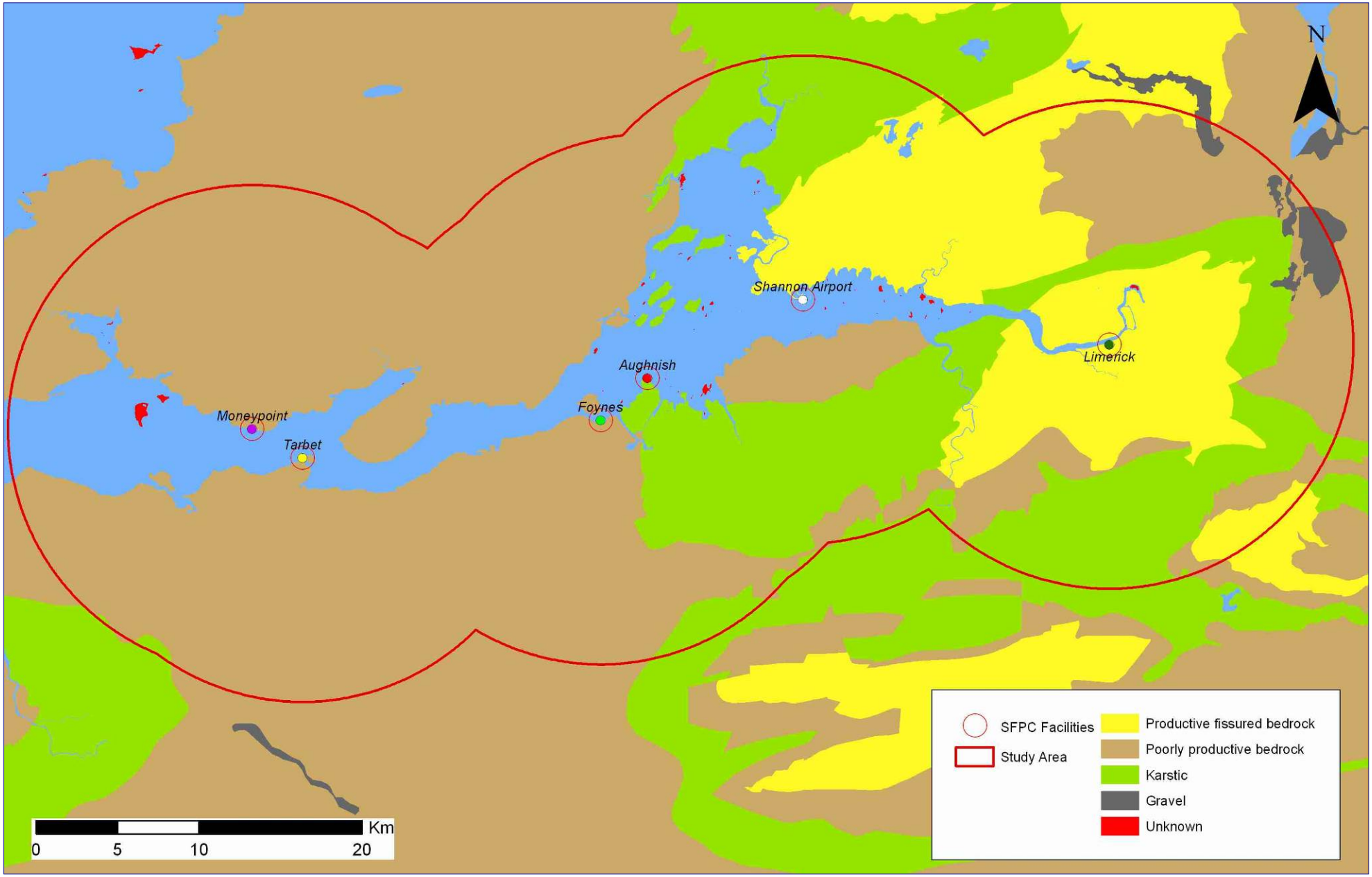


Figure 4.6: Groundwater Vulnerability within Study Area

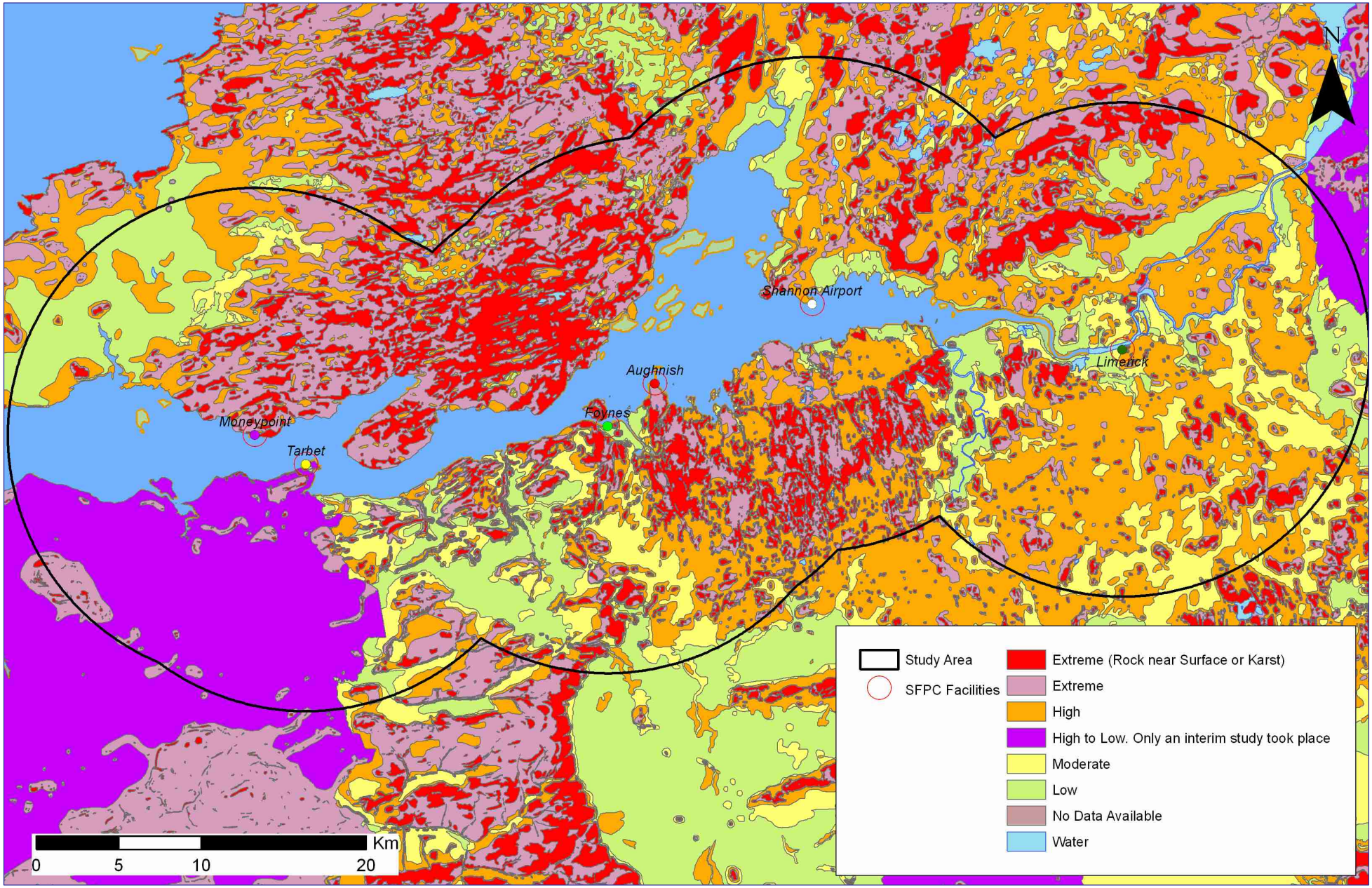
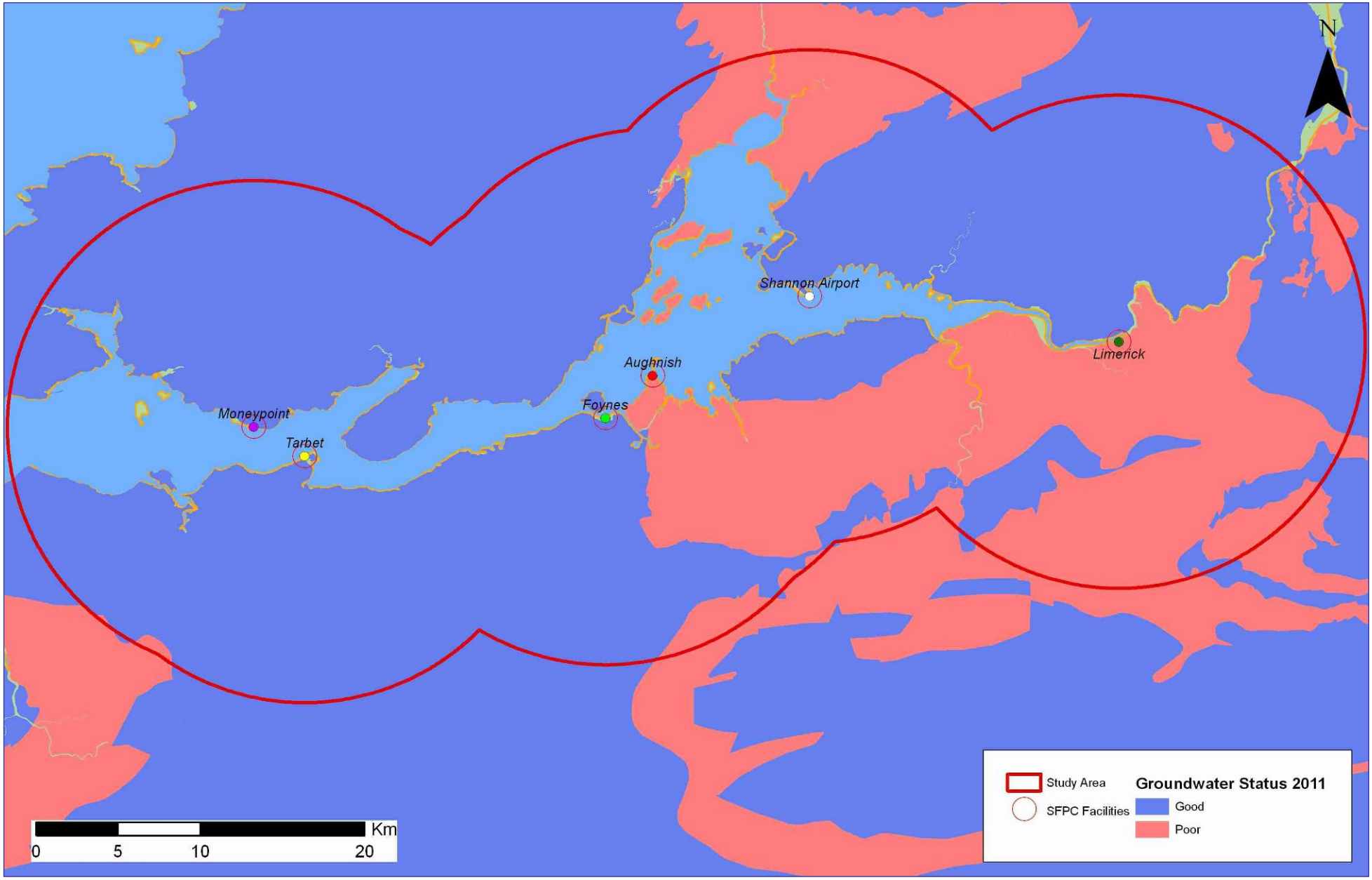


Figure 4.7: Groundwater Status within Study Area



4.3.3.7 Heavily Modified Water Bodies

Some surface waters in the District have been substantially changed in character to allow certain uses such as navigation (for example ports), water storage, public supply, flood defence or land drainage. To recognise that the benefits from such modifications need to be retained, these waters are designated as heavily modified. The most significant physical change in the area of interest is the hydroelectric power scheme with Ardnacrusha Dam, near Limerick, and weirs and sluices, which aid both water storage and navigation at key locations along the system. Limerick Dock is currently designated as a Heavily Modified Waterbody under the Water Framework Directive.

4.3.3.8 Existing Environmental Pressures / Problems: Water

The main pressures on surface and groundwater quality within the area of interest can be summarised into the following categories. These descriptions identify a number of sensitivities with regard to the status of surface and groundwater bodies within the area of interest.

Wastewater and Industrial Discharges

Inadequately treated effluents and spills or leakage from sewerage networks can lead to unacceptable levels of pollutants in receiving waters. These pollutants can damage water quality and downstream uses (e.g. bathing waters, shellfish waters or waters supporting sensitive species). In the Shannon District, estimates indicate that municipal and industrial discharges produce over 20% of the yearly phosphorus load and just under 5% of the nitrogen load. The shortfall in infrastructure at major plants and a myriad of smaller settlements is an issue in this district, in particular combined sewer overflow spillage and run-off from the road network into the District's rivers. Within the SFPC Vision 2041 study area there are 28 WWTP, 8 waste facilities and 42 Integrated Pollution Control licensed facilities as shown in **Figure 4.8**.

Landfills, Mines, Quarries and Contaminated Sites

Waste disposal sites (including old un-lined landfills), quarries, mines, gasworks sites and industrial lands produce lesser discharges to waters than wastewater plants and industries; however subsurface residues or waste products may continue to threaten groundwater and surface waters. The status assessment by the Environmental Protection Agency shows that 75% of groundwaters in the Shannon IRBD currently are at good status. Pollutants (mainly metals and fuel) from landfills and urban areas can seep into the ground and travel though groundwaters to enter surface waters, affecting their quality, damaging aquatic plants and animals and impairing water uses. Water table lowering at some quarry sites can affect nearby wetland areas, and the transfer of groundwater to surface waters can change water chemistry. Within the SFPC Vision 2041 SEA study area there are 13 landfill sites, 19 quarries and 3 mines as shown in **Figure 4.9**.

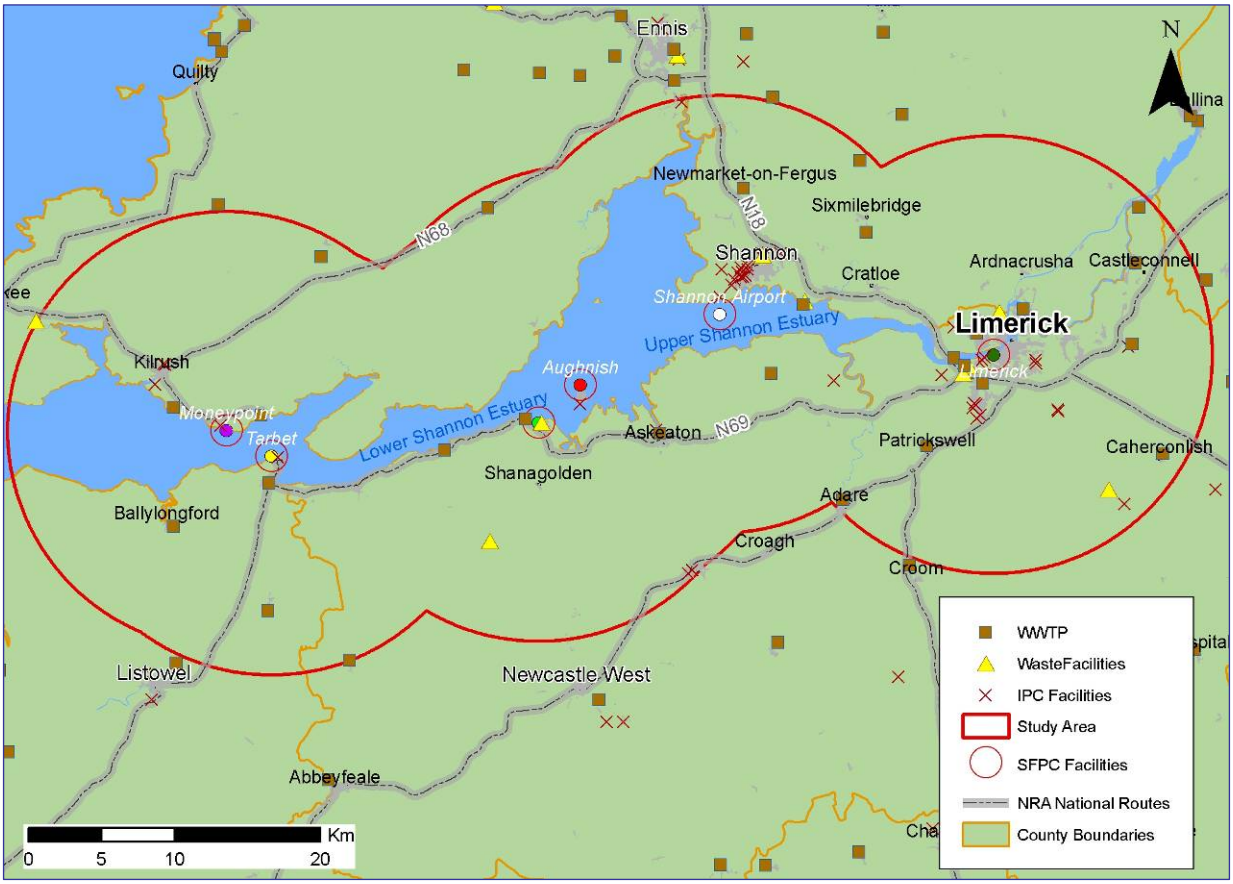


Figure 4.8: Wastewater and Industrial Emissions within Study Area

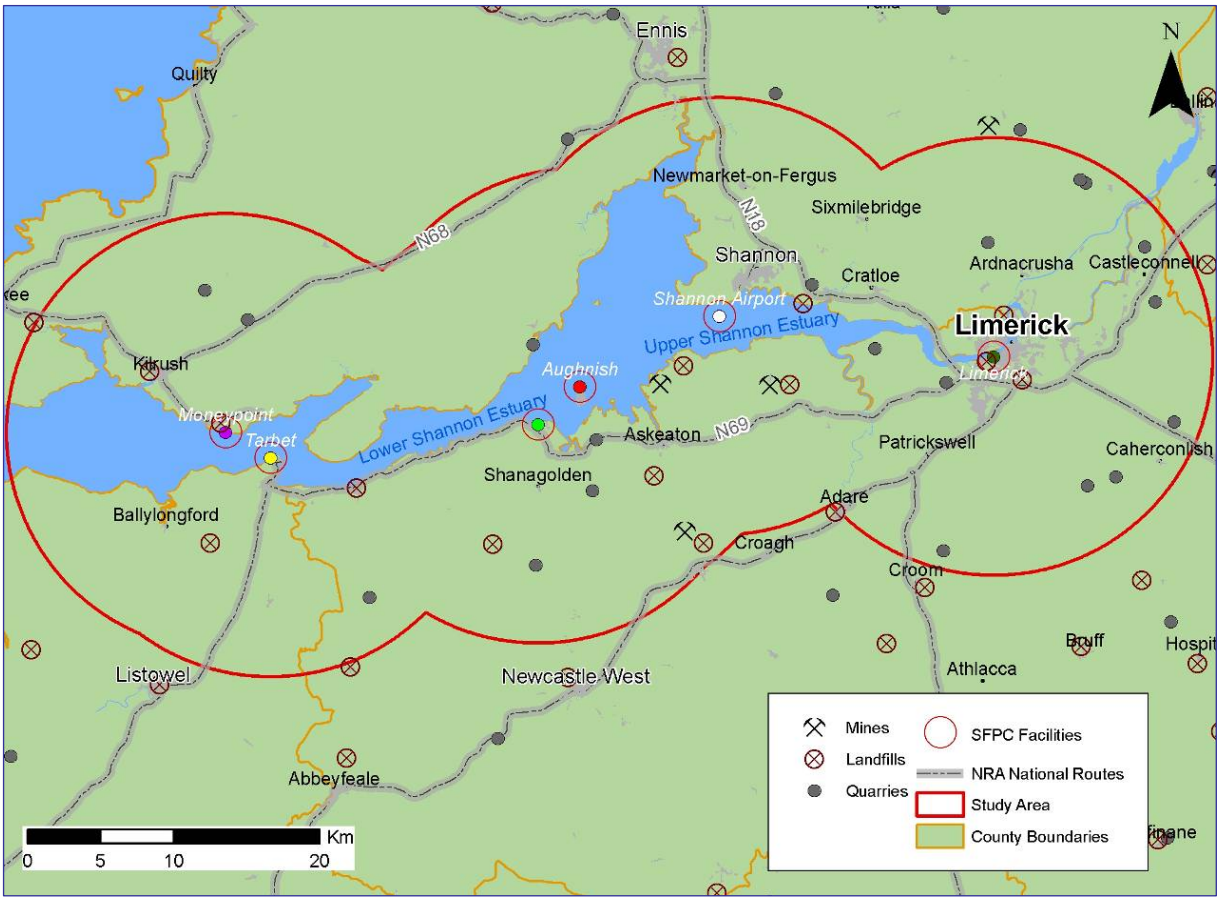


Figure 4.9 Landfills, Mines and Quarries within Study Area

Agriculture

The rich soils of the Shannon River Basin District mean that agriculture is widespread. Over 70% of the land area is farmed. Livestock grazing on the pastureland is the most widespread type of farming. There is also a healthy dairy and meat processing industry in the District.

Two main water quality problems relating to agriculture have been identified. These are enrichment of water by nutrients (phosphorus and nitrogen) and organic pollution from animal slurry/manure and silage effluent. A third, pesticides, is covered under dangerous substances. Estimates of nutrient input into waters in the Shannon District indicate that agriculture produces 55% of the yearly phosphorus load and 85% of the nitrogen load.

Wastewater from Unsewered Properties

In rural areas many houses and businesses are not connected to public systems that collect, treat and dispose of wastewater, and they rely mainly on on-site systems (conventional septic tanks or proprietary systems) via soil percolation areas, which if not designed, installed or operated properly can result in water pollution. The growing population in the area of interest is resulting in an increasing demand for individual houses and housing clusters throughout most of the District. The coastal counties of Limerick, Clare and Kerry have an ever-increasing number of holiday homes. As many properties are spread over wide areas, provision of public sewerage systems, especially ahead of new development, is very difficult and often very costly.

Forestry

Forest cover now accounts for just over 10% of Ireland's land area, with an objective to expand cover to 17% in the next 30 years. Forests can have both positive and negative impacts on the environment. Negative impacts are largely related to poor management or to planting on unsuitable soils. Many of the current water problems associated with afforestation are a legacy of old practices, which have been subsequently amended. In the study area only 7% of the land area is associated with forestry.

Discharge of Dangerous Substances

Some dangerous substances can be toxic to aquatic plants and animals. They can persist in waters and sediments, and slowly build up in the bodies of aquatic organisms, poisoning them and causing problems higher up the food chain or interfering with natural breeding processes. The threat from waste and industrial discharges as well as from household substances is a potential water problem within the study area.

Physical Modifications

Physical modifications can impact waterways by directly affecting habitats, or by indirectly changing natural processes through altering plant and animal communities, by reducing their variety or numbers. The most significant physical change in the area of interest is the hydroelectric power scheme with Ardnacrusha Dam, near Limerick, and weirs and sluices, which aid both water storage and navigation at key locations along the system. The Shannon District is home to other large schemes including ports at Limerick and Foynes, flood protection schemes at Ennis and around

Listowel and coastal defences in counties Limerick, Clare and Kerry. Widespread development on floodplains (e.g. infill of wetland sites and general loss of wetland sites through reclamation), particularly with respect to potential effects on water quality and flooding behaviour, is also a potential environmental problem within this area.

Climate Change

The impact of climate change is difficult to predict, however there is the potential for heavier winter rainstorms to cause more flash flooding, resulting in an increase in diffuse pollution loads from soil run-off and raising the demand for flood controls. Summer droughts are more likely and recent reports have indicated that the effects of climate change in Ireland will have serious consequences for water resources, resulting in a potential 40% reduction in drinking water supplies. Also, temperature changes may give invasive alien species a competitive advantage.

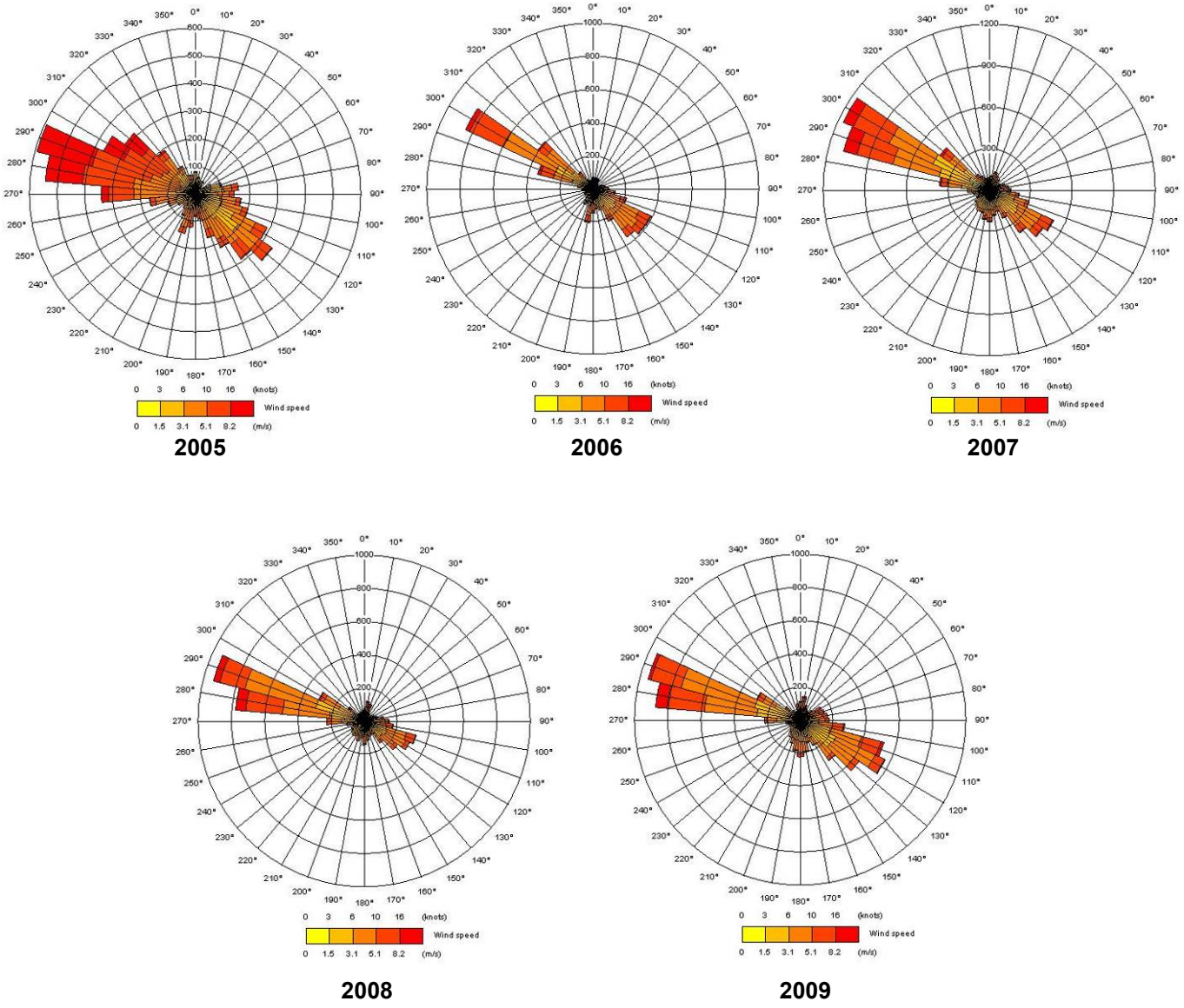
Local Issues

Excessive nutrients in natural waters can lead to the growth of algae and weeds. This enrichment of water is called eutrophication and it is recognised as a major threat to the quality of Irish waters. Algal blooms and weeds can disrupt the normal functioning of an ecosystem, causing a variety of problems. In most cases where there are problems in freshwaters, the enrichment is caused by phosphorous inputs whereas both nitrogen and phosphorous cause problems in estuaries. The sources of these nutrients are sewage, agricultural effluents, fertilisers and industrial wastes. Cruising and boating activities can give rise to certain localised water problems including discharge from on-board toilets, physical disturbance by boat wakes and potential engine oil spillage.

4.3.4 Air and Climate

The climate of Ireland can be defined as being a Temperate Oceanic or Temperate Maritime Climate, which is similar to that of most of north west Europe. Foynes and Limerick are in the south west of Ireland on the Shannon estuary and hence could be more exposed to southerly, westerly and south westerly Atlantic weather. The annual average temperature is about 10°C, with monthly averages of about 15.6°C in July and August and 5.5°C in January and February. The area receives on average 926mm of rainfall a year, which is below that of the far west and south west coasts, but above that of the east coast of Ireland. Mean annual wind speeds in the region are of the order of 5-6m/s and would predominantly come from the west and south west, however as shown in **Figure 4.10** the wind conditions recorded at the Port of Foynes itself are mainly westerlies.

Figure 4.10: Port of Foynes wind roses – 2005 to 2009



The EU Air Framework Directive deals with each EU Member State in terms of Zones and Agglomerations. For Ireland, four zones, A, B, C and D are defined in the Air Quality Standards (AQS) Regulations (SI No 271 of 2002). The main areas defined in each zone are:

Zone A: Dublin Conurbation.

Zone B: Cork Conurbation.

Zone C: 15 urban areas with populations greater than 15,000. Includes Galway, **Limerick**, Waterford, Clonmel, Kilkenny, Sligo, Drogheda, Wexford, Athlone, Ennis, Bray, Naas, Carlow, Tralee and Dundalk.

Zone D: Rural Ireland, i.e. the remainder of the State excluding Zones A, B and C.

The Shannon Estuary lies in Zone D, while Limerick City lies in Zone C, in relation to the EU Air Framework Directive and EPA Air Quality Zones. The index calculation is based on the latest available measurements of ozone, nitrogen dioxide, PM_{10} and sulphur dioxide in Zone D. The current air quality within the Shannon region and Zone D as a whole is ***VERY GOOD***, while within Limerick City the air quality is currently classed as ***GOOD***. Assessment of the Limerick City air quality by the EPA found that PM_{10} levels were above upper assessment threshold, while nitrogen dioxide, carbon monoxide, sulphur dioxide, benzene and lead were all below the lower assessment threshold. The implications of this assessment are that within Zone C levels of PM_{10} must be monitored continuously and levels of nitrogen dioxide, sulphur dioxide, benzene and lead may be assessed using modelling or objective estimation.

There are currently no air quality issues with regards to air quality and emissions from ships or equipment at SFPC facilities. The UK Guidance on Local Air Quality Management LAQM TG (09) (DEFRA, 2009) recommends that detailed assessment of air quality impacts from ports is required only for large ports with more than 5,000 shipping movements per year which have a relevant public exposure within 1km of berthing and manoeuvring areas, and therefore no more detailed assessment of air quality is required within the SFPC jurisdiction as it would generally have some 2,000 shipping movements per year in total at all facilities.

Moneypoint

The estuary also contains many existing industrially active sites which contribute to the air quality in the region. The ESB generating station at Moneypoint is the most important power station in the national emissions reduction plan, NERP. The air emissions targets set out in the NERP are dependent on reductions in emissions from Moneypoint. Having already invested significantly in the Moneypoint environmental retrofit project to reduce sulphur dioxide, SO_2, and oxides of nitrogen, NO_x, emissions, the ESB is keeping abreast of technological developments in this area through its membership of industry bodies, including the Electric Power Research Institute, EURELECTRIC, VGB, the Edison Electric Institute and the Association of Edison Illumination Companies.

Foynes

Recent air quality investigations (Foynes Port, East Jetty EIS, 2011) for Nitrogen Dioxide (NO_2) found all results at all locations, both on average and individually for each monitoring period, were well within the limit values for human health of 40 µg/m3 and the limit values for protection of ecosystems of 30 µg/m3.

Aughinish

A programme of ambient air quality monitoring (both on-site and off-site) is carried out by AAL in accordance with Conditions 5.8 and 6.15 of IPPC Licence P0035-04.

The parameters monitored are:

- Sulphur dioxide

- Deposited Dust
- Particulate Matter below 10µm (PM_{10})
- Particulate Matter below 2.5 µm ($PM_{2.5}$)

All results from the ambient air quality monitoring programme are reviewed versus the relevant limits and thresholds of the Air Quality Standard Regulations (SI 271/2002) along with the I Directive 2008/50/EC. Overall, the monitoring results indicate the ambient air quality in the area is generally good with the various annual and percentile values falling within relevant National Air Quality Standards (NAQS) for those parameters.

Greenhouse gases in the atmosphere (including carbon dioxide, methane, nitrous oxides and a number of gases that arise from industrial processes) are rising, as a result of human activity. Under the Kyoto Protocol, Ireland's target is to limit emissions to 13% above 1990 levels over the five-year period from 2008 to 2012, within the overall EU target to reduce emissions to 8% in the same timeframe. For the period beyond 2012, the EU Council of Ministers has recently committed to achieving at least a 20 per cent reduction of greenhouse gas emissions by 2020, compared to 1990 levels. The Council also agreed to extend this target to a 30 per cent reduction if other developed countries commit to comparable reductions. Ireland's share of the reduction target has yet to be agreed.

4.3.4.1 Existing Environmental Pressures / Problems: Air and Climate

Currently there are no significant concerns with regard to air quality at the area of interest level. Poor wastewater treatment infrastructure can lead to odour nuisance issues at older plants. Dust and PM_{10} can also be a local issue during construction and operation of Port facilities, particularly if handling fine grained cargo and / or during dry windy conditions.

With regard to climate, inputs of greenhouses gasses from water management activities in the area of interest, which require the use of fossil fuels, add to the carbon dioxide emissions produced on the island. The emission of greenhouse gases in general is currently the focus of emission reduction programmes under the Kyoto Protocol agreements. In addition, the potential changes in climate predicted as a result of anthropogenic greenhouse gas emissions are expected to result in pressures on water quantity and precipitation regimes.

4.3.5 Cultural Heritage, including Architectural and Archaeological Heritage

The Shannon Estuary and its surrounding hinterland within the study area would have been a major communication and transport corridor for human movement for thousands of years as it still is today, and therefore the area is rich in cultural heritage, with many castles, fortifications, renewable, enclosures and religious sites within the vicinity of the shoreline and indeed with many of these protected features being located on the numerous islands throughout the estuary.

Within the study area there are 4,641 sites and monuments from the Sites and Monuments Record in Ireland and 16 known shipwrecks. These sites and monuments have been summarised into general groupings in **Figure 4.11**, which shows the high levels of historical settlement in the area of the Shannon Estuary, and in particular around the city of Limerick, and the towns of Shannon and Foynes. The majority of these sites are enclosures and earthworks, cemeteries and burial grounds, religious sites, religious buildings, historical houses, castles and fortifications, however there are also numerous engineering heritage sites, such as windmills (1), wells (11), weirs (67), water mills (7) dams (2), piers and jetties (7). There are no listed sites or monuments within close proximity to the SFPC facilities at either the Port of Foynes or the Limerick Docks.

The distribution of the heritage sites and finds are spread along both sides of the estuary, however on the southern shore around Foynes and Aughinish, and on the northern shore around Clonderalaw Bay the large expanses of mud flats provide rich archaeological material at the mouth of the River Maigue by Carrigdirty and along the Fergus and Owenogarney River. Smaller expanses of soft sediments survive in the Lower Estuary, for example at Carrig Island/Ballylongford on the southern shore, and in Poulnasherry Bay on the northern shore, facing the famous early ecclesiastical site of Scattery Island.

Recent archaeological surveys of intertidal areas in the Shannon estuary have uncovered a wealth of archaeological material including evidence of prehistoric settlement dating back to 7000 BC. There are 8 submerged forest locations, which represent relict woodland that has been inundated by rising water levels and which can date back far into prehistory. The Inventory indicates references to 127 wrecking events between the sixteenth and the early twentieth century.[2] However, only 16 wreck sites can be located precisely. There is little that can be determined from their distribution through the estuary, other than a slight focus at the point where the seaward side of the estuary narrows between Kilconly Point on the Kerry side and Kilcredaun Point to the north on the Clare side.

Two architectural heritage sites are directly involved with Vision 2041, being Bannatyne Mill and Sailors house. Bannatyne Mill is a former corn store, five-stories high with a floor area of 3,129sqm, built between 1873 and 1874, and is a rare example of Victorian industrial architecture. The Bannatyine Mill is a listed building on the Register of Protected Structures for Limerick City and is listed on the National Inventory of Art and Heritage. Sailors House is a classical two storey house, constructed in 1856 and is of significant historical interest, being a listed building on the Register of Protected Structures for Limerick City.

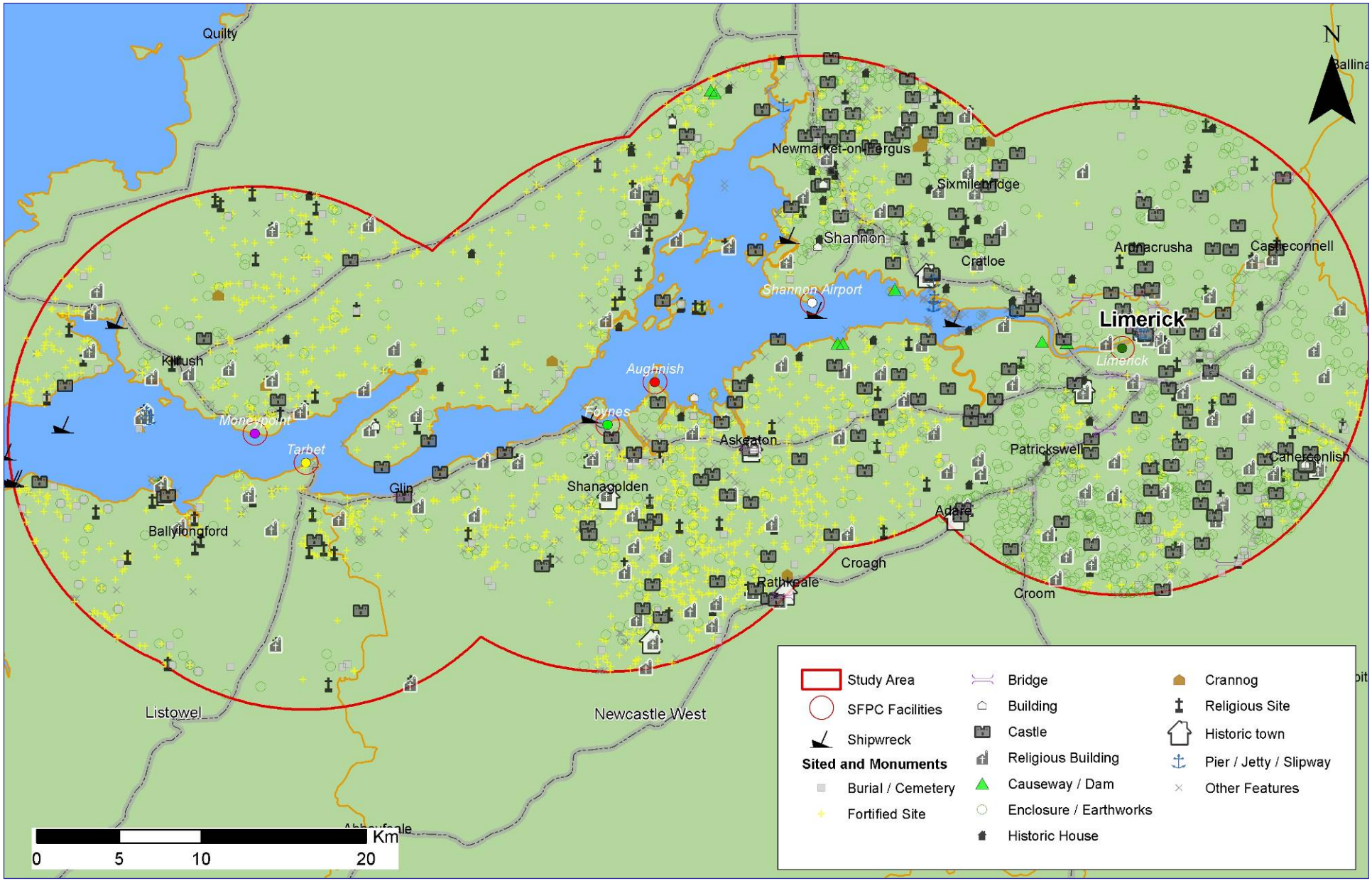
4.3.5.1 Existing Environmental Pressures / Problems: Cultural Heritage

Development resulting from economic growth and increasing population is placing pressure on sites or features of architectural, archaeological or cultural heritage interest. Individually these developments,

[2] Colin Breen and Claire Callaghan, 'Post-medieval shipwrecks, harbours and lighthouses', in: Aidan O'Sullivan, *Foragers, farmers and fishers in a coastal landscape. An intertidal archaeological survey of the Shannon estuary* (Royal Irish Academy, Dublin, 2001): 233-251, p. 239.

including development of water-related infrastructure, puts direct pressure of architectural heritage, where it is in proximity, or increases the potential to interact with known or previously unknown archaeological sites and features. Cumulatively, this results in impacts on the overall cultural heritage resource. Any potential development impacts on the Shannon estuary should be subject to a full archaeological assessment.

Figure 4.11: Cultural, Architectural and Archaeological Heritage



4.3.6 Landscape

The area of interest has many landscape types together with both landscape and seascape character areas. These landscapes range from settled to working landscapes together with living landscapes.

4.3.6.1 Protected Landscape Areas – Ireland

In terms of landscape and visual amenity, local authorities in Ireland aim to conserve and protect areas of scenic value. Each local authority is responsible for the designation of these within their individual jurisdictions, with each Development Plan providing objectives to protect such views. Specific landscape features within the counties are often not listed within these plans, and as such it is difficult to provide a list of these within this baseline.

Table 4.10 shows the wide variety of areas of landscape and seascape characteristics within the 15 kilometre radius of the study area. The Limerick County Development Plan 2010 – 2016 has identified the Shannon Integrated Coastal Management Zone (ICMZ) to be of high visual amenity, especially the areas close to the shore line, which can be admired on the N69 scenic route. In this area the land gradually rises from the Shannon Estuary, leading into farmlands which are enclosed by a series of mature hedgerows. In order to protect the views along the N69, planning will only be granted between the N69 and the Estuary under exceptional circumstances (e.g. extensions to an existing dwelling or a dwelling for a son/daughter of the existing landowner engaged in full or part time farming provided the finished building will be integrated into the surrounding landscape). Other diverse landscapes within the study area that have being recognised in the Limerick County Development Plan include Tory Hill, the Western uplands and the rolling hills that surround Lough Gur.

As Shown in **Table 4.10** the Clare County Development Plan 2011-2017 identifies 5 areas of seascape character and 12 scenic landscapes, as well as a number of valuable scenic routes on the northern shore of the Shannon Estuary. The most significant landscapes within the study area are the Shannon Estuary Farmland, the Fergus Estuary and the Sixmilebridge Farmland. The designated farmland areas surrounding the north shore of the Shannon estuary shows prominent ridges with complex patterns of pasture, woodland and scrub habitats, while the area around the Fergus Estuary displays views of estuarine farmland divided by drainage ditches, with views of the River Shannon that can be admired from along N67 and R473 scenic routes. Much of the northern shore of the Shannon estuary, with the exception of Moneypoint, has been classed as a vulnerable landscape under the Clare County Development Plan and therefore strict planning requirements are enforced for both domestic and commercial developments.

Table 4.10 Designated Landscapes and Seascapes

County	Landscape Designated Areas	Seascape Designated Areas
Limerick	1. Shannon Estuary (N69 route). 2. Agricultural Lowlands. 3. Lough Gur (Lough Gur route). 4. Tory Hill (Tory Hill route). 5. Western Uplands.	1. Shannon Estuary along the southern shore from Foynes to Glin. 2. N69.
Clare	1. Shannon Estuary Farmland. 2. Fergus Estuary. 3. Sixmilebridge Farmland. 4. River Shannon Farmland. 5. Ennis Drumlim Farmland. 6. Callenagh River Farmlands. 7. Slieve Callan Upland. 8. East Clare Loughlands. 9.Kilrush Farmland. 10.Malbay Coastal. 11.Loop Head. 12.Slieve Bernagh Uplands.	1. The Coastline from Aughinish Bay to Clonderalaw Bay 2. The wooded coast around Clonderdaw Bay. 3.The coastlines of Clonderdaw Bay and White Strand . 4. N67 and R473 Scenic Drives.

The Kerry County Development Plan 2009 – 2015 details how the landscape of an area is a combination of natural and man-made features. In Kerry a variety of physical features and biodiversity combine to produce some of the most intriguing diversity of flora and fauna and spectacular scenery in Ireland. The Council recognises the importance of these natural elements to the overall landscape and will strive to protect and enhance the landscape and physical beauty of the county.

4.3.6.2 Existing Environmental Pressures / Problems: Landscape and Visual

Existing pressures on landscape and visual resources as a result of water management activities are limited and are primarily related to impacts to sensitive views and landscapes resulting from the siting of development, including water related infrastructure, without sensitivity to these resources. It could be argued that the SFPC facilities have already impacted upon the local landscape and are now part of the landscape.

4.3.7 Material Assets

4.3.7.1 Water Related Material Assets

Shannon Foynes Port Company facilities are in themselves relatively large scale industrial assets that provide a gateway for the import and export of goods to and from outside Ireland. SFPC is Ireland's largest bulk port, and second largest overall, measured by tonnes of cargo throughput. Specialising in bulk cargoes SFPC accounts for more than 35% of all bulk cargoes in Ireland. In 2011 the Port handled in excess of 10 million tonnes of cargo which had increased by 8% between 2010 and 2011. Whilst total throughput in the Estuary is boosted by the large scale facilities at Aughinish and Moneypoint, the main generalised cargo handling facilities at the Port of Foynes and Limerick Docks handled in excess of 2.2 million tonnes of cargo in 2011.

With the study area there are 126 abstractions, which are taken from a mix of groundwater, spring, estuary and surface water sources and are used for both public and private water supplies. The nearest abstractions to the Port of Foynes are over 3km away to the south and east, which are mainly groundwater extractions, except for the Aughinish Alumina site which extracts from the Shannon Estuary. The nearest abstractions to the Limerick Docks are private groundwater abstractions over 1km to the east of the site.

There are 6 water treatment plants and 28 wastewater treatment works (WWTW) in the study area. The majority of the WWTW discharge to rivers, however a few discharge to lakes and transitional waters.

There are over 5.5km of shoreline reinforcements within the area of interest, being mainly at Kilrush, Glin, Port of Foynes and Tarbet.

4.3.7.2 Transport Infrastructure

The area of interest is relatively well serviced with a network of National and Regional routes that either pass through or are adjacent to the area. These include:

Motorways

- Limerick to Dublin – M7
- Ennis to Shannon – M18

National Primary Routes

- Limerick to Shannon – N18
- Limerick to Askeaton to Foynes to Glin – N69
- Ennis to Kilrush – N68.

Both the National Spatial Strategy and the Mid West Regional Planning Guidelines outline the critical importance to the Mid-West of transport corridors. The strategic radial corridor of Dublin/Limerick provides excellent quality road and public transport connections to the mid-west, including access to Shannon Airport and the Shannon Estuary ports and support services. The National Spatial strategy recognizes the Limerick/Ennis/Shannon area as a gateway/hub zone whose further development is a key component of the National Spatial Strategy.

The study area is not very well served with rail systems with the West Clare railway no longer running and similarly the rail link to Foynes has also fallen into disrepair with no rail link along the coast to Kerry Head or to Shannon Airport. A railway line has been in existence at Foynes since 1858 and ran as a passenger line from Limerick City terminating at Foynes. The line was closed to passengers in 1963 and used by Iarnród Eireann as a freight line until 2000, when it was closed and has not been used since then.

Shannon Airport is a critical element of the transport network in the region with both a national and international role. It is strategically located between Limerick and Galway with capacity to serve an increased market to the west should future development take place in the estuary which requires air transport. The Airport boasts the longest runway in Ireland, at 3,199 metres in length, 45 metres wide and in operation 24 hours per day, 365 days per year. The Airport has both scheduled and chartered flights to a range of destinations and has 30 aircraft stands. In 2000, the new terminal building at Shannon Airport was opened. The Mid-West Regional Planning Guidelines recognise the importance of Shannon International Airport as a key hub both for national and international air travel.

Aviation is vital to the future business of Ireland in terms of tourism and trade, and connectivity between airports and public transport is a key element of this. In this context, the Shannon Local Area Plan and Clare County Council supports the achievement of a future rail link to Shannon Airport from the main Ennis-Limerick line, as outlined in objective CDP 11.11 of the Clare County Development Plan 2011-2017. It is recognised that this route may not be delivered in the near future, however there are important interim measures which can assist in improving public transport connections to the Airport via improved bus linkages. In addition to this it is considered that the existing Aerospace Road will need to be extended to facilitate future development of and access to the Airport lands located north and north-west of the existing runway.

The study area is also connected with Limerick City which is a regional gateway city with advanced third level education and research institutions. At present, Limerick City is preparing a strategy to turn the city towards the river and its bridges, and overall, to highlight the Shannon as one of the city's central landmark attractions. This will include walkways, cycleways, viewing points etc and should be considered during the assessment of cumulative impacts and in combination effects.

4.3.7.3 Energy Infrastructure

EirGrid is the independent electricity Transmission System Operator (TSO) for the Republic of Ireland. The Transmission System, often referred to as "The National Grid", is a meshed network of approximately 6,500km of high voltage, 110,000 volts (110kV), 220,000 volts (220kV) and 400,000 volts (400kV), overhead lines and underground cables and over 100 transmission stations. The system can be compared to Ireland's motorway network – delivering power to over 100 bulk transfer points or "nodes" all over Ireland where power can be taken onwards on lower voltage, distribution system, lines to individual customers' premises.

Power is generated by power plants and wind farms throughout the country, utilising a variety of fuel or energy sources – including gas, oil, coal, peat, hydro, wind and other sources such as biomass and landfill gas. The deployment of renewable energy sources in the electricity sector has been steadily increasing. Ireland and Northern Ireland are committed to increasing the level of renewable electricity on the power system to 40% by 2020. Counties Clare, Kerry and Limerick are areas of future growth

with regards to renewable energy, with the excellent potential for onshore and offshore wind energy and offshore wave energy. The SFPC are currently working with the enewable sector with their facilities being used for construction and storage of wind turbines.

4.3.7.4 Existing Environmental Pressures / Problems: Material Assets

Alongside Shannon Airport the SFPC facilities present some of the most important material assets in the study area, as are the major importer and exporter of goods in the region. Any expansion of these facilities will undoubtedly involve encroachment into the natural environment or towards inhabited areas and will therefore have environmental and/or social impacts. Any expansion will also most likely require the augmentation of existing infrastructural facilities, such as the existing port facilities and equipment, the energy and water supplies and the existing transport links. This therefore has the potential for cumulative environmental and/or social impacts.

4.3.8 Soil and Land Use

4.3.8.1 Geology

The west of the study area is almost exclusively underlain by Fluvio-deltaic and basinal marine (Turbidic) shale, sandstone, siltstone and coal, while the east of the study area is underlain mainly by Marine shelf facies limestone and calcareous shale and Waulstorian Mudbank pale-grey massive limestone. A smaller finger of Continental redbed facies, sandstone, conglomerate and siltstone intrudes into the study area from the north east, running between Limerick and Shannon. The bedrock geology of the study area is shown in **Figure 4.10**.

4.3.8.2 Soils

Soils in the study area are generally a mixture of peats, grey brown podzols, brown earths and gley soil. On either side of the lower Shannon the soils are mainly poorly drained gley soils and acid brown earths. In the upper Shannon the soils are mainly grey brown podzols, gleys and brown earths. The gleys and peats in the south west and north west of the study area would be of poor drainage characteristics, while the acid brown earths, brown earths, and grey brown podzolics in the south east and west of the study area would be considered to be well drained. The grey brown podzolics in the north east of the study area would be considered to be of moderate drainage characteristics. The soil types of the study area is shown in **Figure 4.11**.

4.3.8.3 Land Use

Land use within the study area is predominantly agricultural (70%), with the majority of the study area being used as pasture land (61%). The next most common feature in the study area is obviously waterbodies, with this taking up 11% of the surface area of the study area, with almost all of this being estuary. Wetlands also take up a significant area at 8% of the total, while forests take up 7% of the

study area. Artificial surfaces only takes up 4% of the total study area, with over half of this artificial surface being discontinuous urban fabric. The Port of Foynes is in an area of industrial and commercial units, surrounded by the town of Foynes, mixed forest areas, pasture land, estuary and transitional woodland scrub on Foynes Island. The Limerick Docks are also classed as an area of industrial and commercial units, which are surrounded by estuary, river, the continuous and discontinuous urban fabric of Limerick City, and pastureland in the outskirts of Limerick City. The land use types of the study area are shown in **Figure 4.12**.

4.3.8.4 Mineral Potential

The island can be divided into a number of mineral provinces that are endowed with a diverse suite of base and precious metals, as well as industrial minerals. The majority of the area of interest is contained within the Central Ireland Basin mineral province of the island. The location of gold, silver and copper mineral deposits can be found the Upper Shannon and Fergus Estuaries in Clare and Limerick. **Figure 4.10** illustrates the known mineral deposits located within the study area along with the Bedrock Geology of the area. A large number of mineral locations (165) exist in the study area, with the most common resources being clay, limestone and coal.

Within the SFPC Vision 2041 SEA study area there are 13 landfill sites, 19 quarries and 3 mines as shown previously in **Figure 4.8**.

Figure 4.10: Mineral Deposits and Bedrock Geology within Study Area

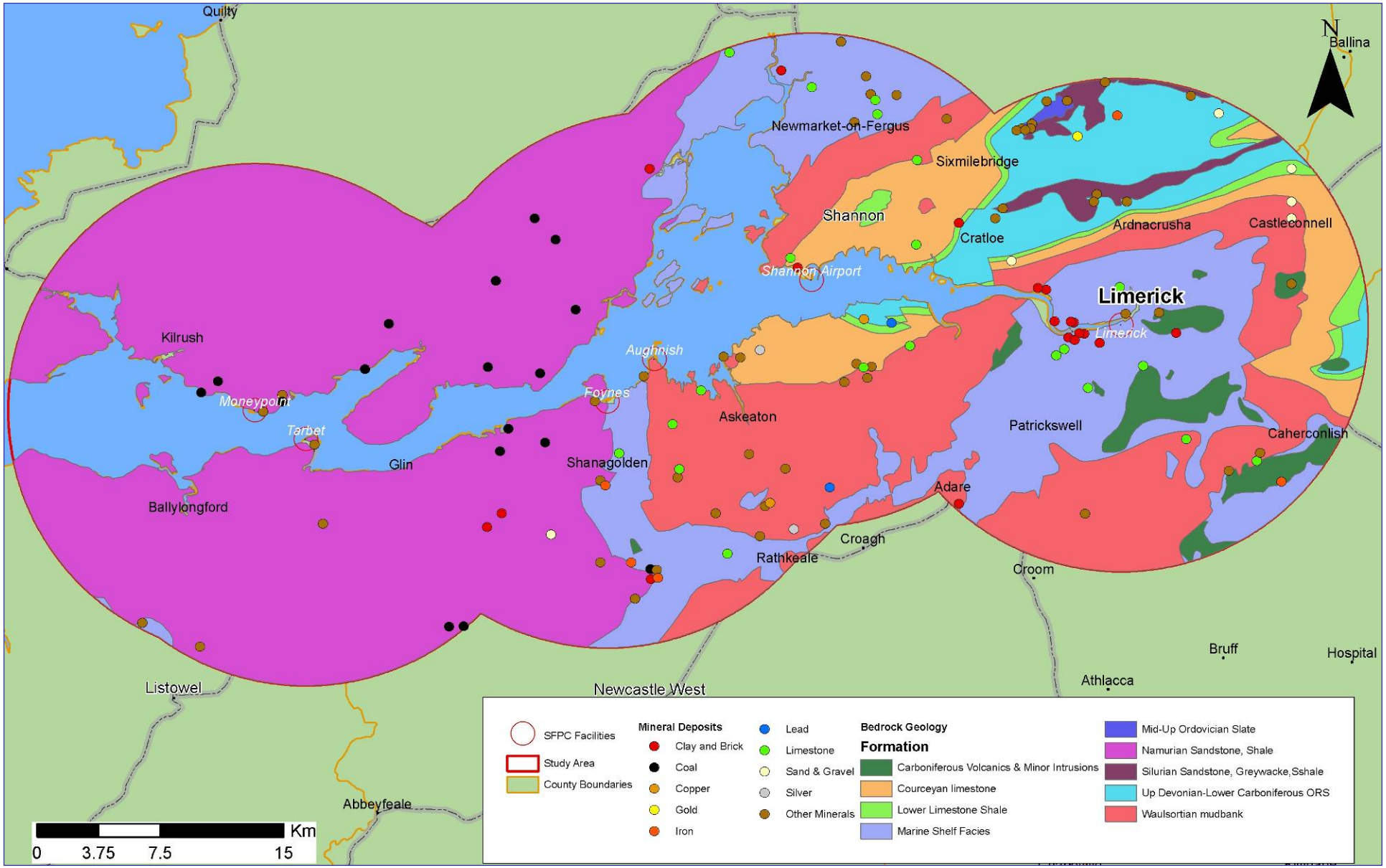


Figure 4.11: Soils within Study Area

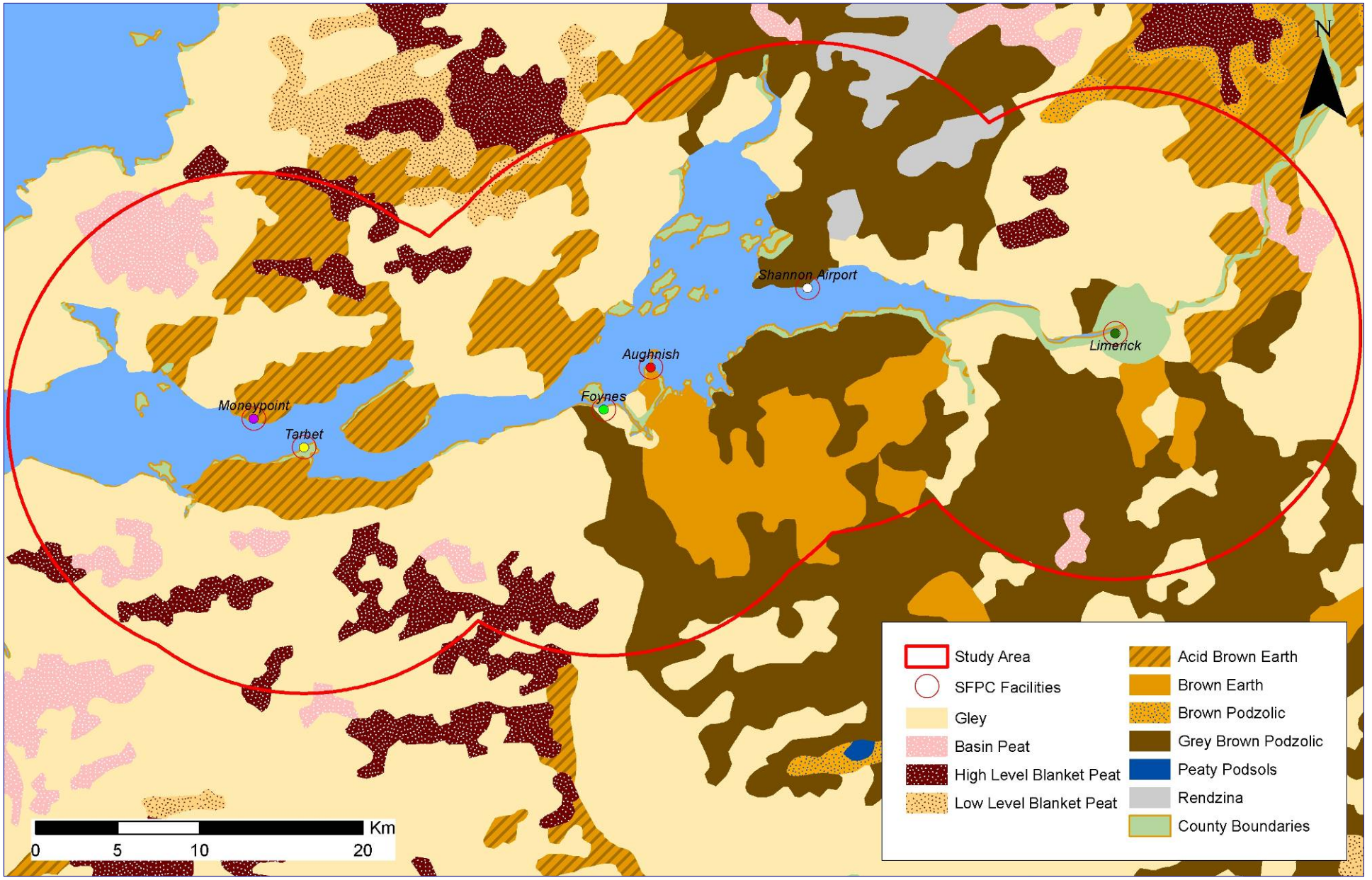
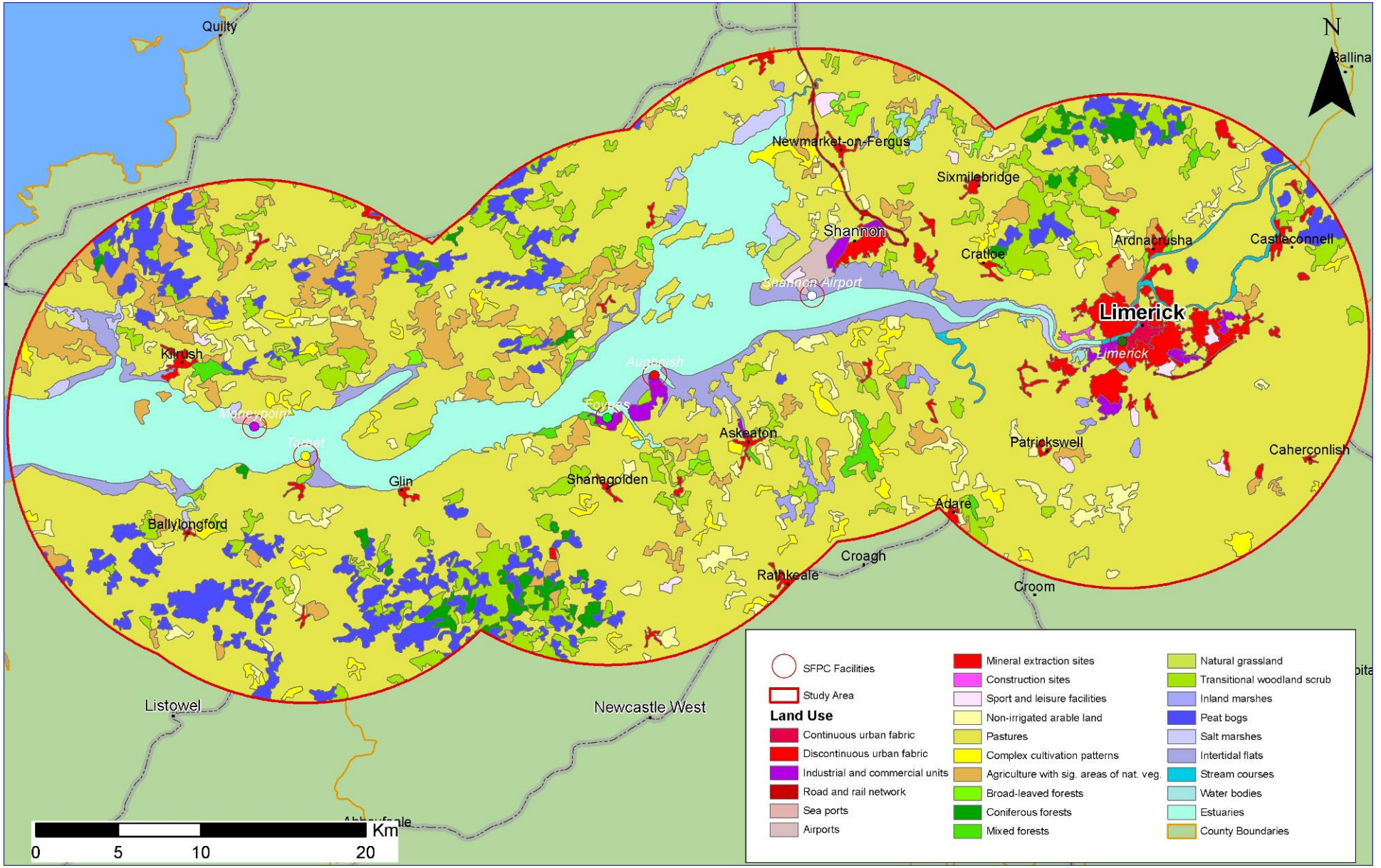


Figure 4.12: Land Use within Study Area (Corine 2006)



4.3.8.5 Dredging

Dredging in order to maintain safe shipping channels and port functioning will be required to counteract the natural processes of erosion and deposition. In terms of ecology, dredging is disruptive to the channel bed, often completely disturbing its physical configuration and ecology by removing habitats and associated species within the dredged area. The Shannon Estuary is designated as a Special Areas of Conservation or SAC under the EU Habitats Directive. Among the range of qualifying interests are a number of fish including Atlantic salmon (only in freshwater habitats), and sea and river lamprey. There are also significant populations of European smelt (listed in the Irish Red Data Book for Vertebrates) in these waters. The fish species listed above all avail of the waters of the Shannon estuary to different degrees. Different life stages of these species engage in passage through the transitional (estuarine) waters at different times of year. Adult salmon migrate from the sea to freshwater at all times of the year while salmon smolts migrate from freshwater to the sea primarily during the months of March to May. Sea Lamprey adults migrate to freshwaters during the months of March to May while young adults migrate from freshwater to the marine environment during autumn and winter. Smelt spend the majority of their lives living and feeding in the estuary, returning to spawn in freshwater during the period of February to April. Slob or estuary trout are also resident within the Shannon estuary. Like sea trout they migrate back up the tributary rivers to spawn. Eels also migrate through the estuary and the availability of clean mudflats and mud deposits are fundamental for their navigation through the estuary. In view of the passage of various species through the estuary and the residency of others, it is clear that actions such as dredging or other similar developments occurring in these waters, that might impact on fish passage or other life stages, should be seriously examined as to their appropriateness in the context of the conservation objectives of this Special Area of Conservation.

4.3.8.6 Existing Environmental Pressures / Problems: Soil and Land Use

Predictions have been made about the impact of global warming on Ireland, with these predictions indicating a change to wetter winters and drier summers (Sweeney, 1997). In addition there may be an increase in frequency of high intensity rainfall events. Such precipitation changes could have serious implications for slope stability and landslides and their resultant impacts on water management and coastal activities.

Eroded soil washed into rivers and estuaries during heavy rainfall contains an increased nutrient content, which can damage the balance of nutrient poor, aquatic ecosystems by shifting their species composition, supporting more nutrient-loving species. This can lead to the eutrophication of rivers and lakes. If contaminated soils are eroded and transported to the sea, aquatic plants and animals can be severely damaged.

Extraction activities, when mismanaged, are resulting in pressures on water quality. Conversely the extractability of mineral, sand and gravel resources is also being curtailed by the encroachment of residential and infrastructural development.

4.4 EVOLUTION OF THE ENVIRONMENT IN THE ABSENCE OF THE PLAN

SFPC Vision 2041 sets out the potential options for the future development of SFPC facilities over the next 30 years, in response to the anticipated pressures of increased tonnages being received in Irish ports. In the absence of the Plan, no development would take place at the existing facilities and therefore there would be no additional capacity to receive and process goods in this area of Ireland, unless received by air freight.

According to a recent EPA report (2010) trends in water quality in Ireland show an overall improvement; however, the rate of this improvement in surface waters is not sufficient to meet the requirement of having good status in all waters by 2015 as required by the Water Framework Directive. The absence of Vision 2041 is not expected to affect this trend.

The trend for air quality in Ireland is a year on year improvement with a reduction in the main pollutant concentrations (with the exception of ozone). The absence of Vision 2041 is not expected to affect this trend. Due to the ongoing improvements in engine technology and the tightening of environmental legislation for vehicle (terrestrial and marine) emissions it would be anticipated that the air quality in the study area would improve in the future. It is however likely that there would continue to be some nuisance air quality issues due to dust, noise and emissions from general port activities.

As a result of manmade greenhouse gas emissions, climate change is predicted to occur in the future regardless of action. The UN Intergovernmental Panel on Climate Change (IPCC) in their *Climate Change 2007: Climate Change Impacts, Adaptation and Vulnerability Report* predict sea level rise, changes in rainfall patterns and temperatures as well as changes in the frequency of droughts and extreme weather events. The potential impacts from sea level increases, increased flooding, summer droughts, etc., will impact on water management. The absence of the Plan is not expected to affect this trend.

According to the EPA report “Implications of the EU Climate Protection Target for Ireland”, *‘water supply and quality are highly sensitive to climate variability and change. Future changes in climate are likely to have major impacts on water resources in Ireland. Recent research by Murphy and Charlton (2006) outlines spatial changes in run-off for Ireland in future downscaled scenarios. The results highlight the importance of individual catchment characteristics in controlling response to climate change. Reductions in groundwater storage and recharge will increase the risk of drought in some areas. The likelihood and magnitude of flood events are also likely to increase, which has important implications for infrastructure and development on affected flood plains. Also, there will be impacts upon the reliability of existing flood defences, and, in the future, increased insurance costs. Water*

quality is another area for concern as in certain areas it may be impacted by the contamination of coastal aquifers from saline intrusion'.

Therefore, evolution of the climatic environment in the absence of the Plan is likely to be heavier winter rainstorms causing more flash flooding, resulting in an increase in diffuse pollution loads from soil run-off and increasing demand for flood controls. These types of flood events (though not directly addressed by the Plan) would continue to pose a risk to soils as a result of erosion and release of contaminants, thus potentially leading to further water quality problems. The absence of the Plan is not expected to affect this trend.

Summer droughts are also likely and recent reports have indicated that the effects of climate change in Ireland will have serious consequences for water resources, resulting in a potential 40% reduction in drinking water supplies. Also, temperature changes may give invasive alien species a competitive advantage. The absence of the Plan is not expected to affect this trend.

In the absence of the Plan there will be no development at SFPC facilities and there is also unlikely to be any significant amount of development in the study area. The SFPC would be a major catalyst for the development of new material assets in the region, being the main source for imported materials and a hub for industry in the area. Without the development and implementation of Vision 2041 it is unlikely that the region would be able to tap into the greatly anticipated offshore and onshore renewable energy work in the area, which is seen by many as the future for many industries in Ireland. If SFPC facilities are unable to compete with similar facilities throughout Ireland there would likely be the potential for job losses throughout the study area.

In the absence of the Plan there is the potential for two cultural heritage features not to be re-developed, being Bannatyne Mill and Sailors House, both of which are on the Limerick City Register of Protected Structures. Re-use of cultural, architectural and archaeological features can often be the best method of preservation, provided these features are sympathetically restored.

5 REVIEW OF RELEVANT PLANS, PROGRAMMES AND POLICIES

5.1 INTERACTION WITH OTHER RELEVANT PLANS AND PROGRAMMES

Table 5.1: Preliminary Review of Legislations, Plans, Policies and Programmes – International

Topic	Title	Summary of Objectives
	UN Convention on Biological Diversity (1992)	Objectives include the maintenance and enhancement of Biodiversity.
Biodiversity	The Ramsar Convention The Convention on Wetlands of International Importance (1971 and amendments)	Objectives include protection and conservation of wetlands, particularly those of importance to waterfowl as Waterfowl Habitat.
	Ospar Convention (1992) The Convention for the Protection of the Marine Environment of the North-East Atlantic	The current instrument guiding international cooperation on the protection of the marine environment of the North-East Atlantic. Objectives include the protection of the marine environment.
Climate	UN Kyoto Protocol The United Nations Framework Convention on Climate Change (UNFCCC) Kyoto Protocol 1997	Objectives seek to alleviate the impacts of climate change and reduce global emissions of GHGs.
Cultural Heritage, including Architectural and Archaeological Heritage	The World Heritage Convention United Nations Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris 1972)	Objectives seek to ensure the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage and ensure that effective and active measures are taken for these.
Pollution	International Convention for the Prevention of Pollution from Ships (MARPOL, 1973, 1978, 1997)	The MARPOL Convention addresses pollution from ships by oil; by noxious liquid substances carried in bulk; harmful substances carried by sea in packaged form; sewage, garbage; and the prevention of air pollution from ships.

Table 5.2: Preliminary Review of Legislations, Plans, Policies and Programmes – European Union

Topic	Title	Summary of Objectives
Air	The Air Framework Directive Directive on Air Quality Assessment and Management (Framework Directive) (1996/62/EC)	Objectives include the prevention and/or reduction of airborne pollutants for the protection of human health and environment.
	Clean Air For Europe (CAFÉ) Directive (2008/50/EC)	Replaces the Framework Directive and the first, second and third Daughter Directives. Defines limit values for specific pollutants in order to protect our health, vegetation and ecosystems.

Topic	Title	Summary of Objectives
	Directive on National Emission Ceilings for Certain Atmospheric Pollutants (2001/81/EC)	Objectives seek to limit the national emissions of certain airborne pollutants for the protection of human health and the environment.
Biodiversity	The EU Biodiversity Strategy Communication on a European Community Biodiversity Strategy	Objectives seek to prevent and eliminate the causes of biodiversity loss and maintain and enhance current levels of biodiversity.
	The EU Habitats Directive (92/43/EEC)	Objectives seek to prevent and eliminate the causes of habitat loss and maintain and enhance current levels of biodiversity.
	The EU Birds Directive (as modified) (EC/79/409)	Objectives seek to prevent and eliminate the causes of bird species loss and maintain and enhance current levels of biodiversity.
	The Plant Protection Products Directive (91/414/EEC)	Objectives seek to harmonise the overall arrangements for authorisation of plant protection products within the European Union. This is achieved by harmonising the process for considering the safety of active substances at a European Community level by establishing agreed criteria for considering the safety of those products. Product authorisation remains the responsibility of individual Member States.
Climate	Second European Climate Change Programme (ECCP II) 2005.	Objectives seek to develop the necessary elements of a strategy to implement the Kyoto protocol.
	Adapting to climate change in Europe – options for EU action {SEC (2007) 849}	Objective is to kick-start a Europe-wide public debate and consultation on how to take forward possible avenues for action in adapting to climate change at EU level.
Cultural Heritage, including Architectural and Archaeological Heritage	Convention for the Protection of the Archaeological Heritage of Europe (revised) (Valletta 1992)	Objective is to protect the archaeological heritage as a source of the European collective memory and as an instrument for historical and scientific study.
	Convention for the Protection of the Architectural Heritage of Europe (Granada 1985)	Objectives seek to provide a basis for protection of architectural heritage and are a means for proclaiming conservation principles, including a definition of what is meant by architectural heritage, such as monuments, groups of buildings and sites. The Convention also seeks to define a European standard of protection for architectural heritage and to create legal obligations that the signatories undertake to implement.
Landscape	European Landscape Convention (ETS No. 176), Florence, 20 October 2000	The Convention promotes the protection, management and planning of European landscapes and organises European co-operation on landscape issues.
Sustainable Development	Environmental Liability Directive 2004/35/EC	Seeks to achieve the prevention and remedying of environmental damage – specifically, damage to habitats and species protected by EC law, damage to species or habitats on a site of special scientific interest for which the site has been notified, damage to water resources and land contamination which presents a threat to human health. It reinforces the "polluter pays" principle – making operators financially liable for threats of or actual damage.
	The Gothenburg Strategy (2001) Communication from the Commission on "a Sustainable Europe for a Better World"	Objectives seek to make the future development of the EU more sustainable. Informs the 6th EAP and the Irish sustainable development strategy.

Topic	Title	Summary of Objectives
	The SEA Directive (2001/42/EC)	Objective is to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development, by ensuring that, in accordance with this Directive, an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment. Under the SEA Directive, the Plan to develop Restore the Ulster Canal – Upper Lough Erne to Clones, would require an SEA.
	The EIA Directive (2011/92/EEC)	Objective is to require Environmental Impact Assessment of the environmental effects of those public and private projects, which are likely to have significant effects on the environment.
Water	The Water Framework Directive EU Water Framework Directive (2000/60/EC)	Objectives seek to maintain and enhance the quality of all surface waters in the EU.
	Groundwater Directive (2006/118/EC)	This directive establishes a regime, which sets underground water quality standards and introduces measures to prevent or limit inputs of pollutants into groundwater.
	EU Floods Directive (2007/60/EC)	The aim of the EU Flood Directive is to reduce and manage the risks that floods pose to human health, the environment, infrastructure and property.
	European Communities (Assessment and Management of Flood Risks) Regulations S.I. 122 of 2010	The 'Floods' Directive was transposed into Irish law by the European Communities (Assessment and Management of Flood Risks) Regulations 2010. (SI 122 of 2010). The Regulations set out the responsibilities of the OPW and other public bodies in the implementation of the Directive, on consultation, and details the process for implementation of the measures set out in the flood risk management plans.
	Bathing Water Directive 2006/7/EC	The overall objective of the revised Directive remains the protection of public health whilst bathing, but it also offers an opportunity to improve management practices at bathing waters and to standardise the information provided to bathers across Europe.
	Drinking Water Directive (DWD) 98/83/EC	The primary objective is to protect the health of the consumers in the European Union and to make sure the water is wholesome and clean.
	The EU Freshwater Fish Directive (78/659/EEC)	Objectives seek to protect those fresh water bodies identified by Member States as waters suitable for sustaining fish populations. For those waters it sets physical and chemical water quality objectives for salmonid waters and cyprinid waters
	Urban Wastewater Treatment Directive 91/271/EEC. Amended under Directive 98/15/EEC	The primary objective is to protect the environment from the adverse effects of discharges of urban wastewater, by the provision of urban wastewater collecting systems (sewerage) and treatment plants for urban centres. The Directive also provides general rules for the sustainable disposal of sludge arising from wastewater treatment.
	Marine Strategy Framework Directive (2008/56/EC)	This Directive establishes a framework within which Member State shall take the necessary measures to achieve or maintain good environmental status in the marine environment by the year 2020 at the latest.

Table 5.3: Preliminary Review of Legislations, Plans, Policies and Programmes – Ireland

Topic	Title	Summary of Objectives
Air	Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002)	Objectives include the reduction of certain airborne pollutants for the protection of human health and the environment.
	Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004).	Objectives include the reduction of certain airborne pollutants for the protection of human health and the environment.
	The Environmental Protection Agency Act 1992 (Ambient Air Quality Assessment and Management) Regulations 1999	Objectives include the reduction of certain airborne pollutants for the protection of human health and the environment.
Biodiversity	The National Biodiversity Plan (2002)	Objectives include the enhancement and conservation of biodiversity. It builds upon the achievements of the previous plan and focuses on actions that were not fully completed and addresses emerging issues. It has been developed in line with the EU and International Biodiversity strategies and policies. Although such issues would be dealt with at local or site level, the Plan should have regard to these objectives and promote such objectives where possible.
	The Wildlife Act 1976. The Wildlife (Amendment) Act 2000	The Wildlife Act, 1976 and the Wildlife Amendment Act, 2000 are the principal statutory provisions providing for the protection of Wildlife (both Flora and Fauna) and the control of activities which may impact adversely on the conservation of Wildlife.
	European Communities (Birds and Natural Habitats) Regulations, S.I. No. 477 of 2011	The European Communities (Birds and Natural Habitats) Regulations 2011 meet the requirements of rulings of the European Court of Justice against Ireland which found significant fault with Ireland's previous transposition regulations. They also build on several years' experience of implementation of the Directives and provide more appropriate and effective tools to protect Ireland's endangered wildlife and habitats. The obligations of various public bodies in regard to sites designated for the protection of endangered wildlife have been clarified and strengthened. These sites consist of Special Protection Areas (SPAs), designated for the protection of birds, and Special Areas of Conservation (SACs) designated for the protection of other important habitats such as raised bogs, native woodland and sand dune systems etc. Collectively these sites form part of the EU wide Natura Network. In addition, general obligations are placed on all public authorities to exercise their functions to secure compliance with the Birds and Habitats Directives and to uphold and enforce the requirements of the Regulations. The Regulations contain new powers allowing the Minister to identify "activities requiring consent". These are activities which are likely to harm an SAC or SPA or its species or habitats. Such an activity cannot proceed without first obtaining the consent of the Minister. This can relate to activities within or outside SACs or SPAs
	The Fisheries Acts, 1939 to 2003 (S.I. No. 17 of 1939; S.I. No. 21 of 2003)	These acts provide for the efficient and effective management, conservation, protection, development and improvement of fisheries, hatcheries and fish farms. The bodies responsible for their implementation are the Fisheries Boards. The Fisheries Boards must ensure the suitability of fish habitats, including taking consideration of the conservation of biodiversity in water ecosystems. Fisheries legislation does not

Topic	Title	Summary of Objectives
		allow barriers to migration or the obstruction of the passage of fair or the impairment of the usefulness of the bed and soil of any waters as spawning grounds or their capacity to produce the food of fish. It also requires those involved in aquaculture to obtain a licence.
	Flora Protection Order 1999	Objectives include it being illegal to alter, damage or interfere in any way with their habitats. This protection applies wherever the plants are found and is not confined to sites designated for nature conservation.
	Quality of Salmonid Waters Regulations 1988 (SI 293 of 1988)	Prescribe quality standards for salmonid waters and designate the waters to which they apply, together with the sampling programmes and the methods of analysis and inspection to be used by local authorities to determine compliance with the standards. Also, give effect to Council Directive No. 78/659/EEC on the quality of fresh waters needing protection or improvement in order to support fish life
Climate	National Climate Change Strategy (2000) and National Climate Change Strategy 2007-2012	Objectives include the reduction of national GHG emissions (including those from the water sector). The Plan should give regard to these objectives and targets for reductions in CO_2 equivalents from the water sector. Adaptation Section of Strategy outlines predicted future trends of climate change in Ireland and proposes adaptation measures.
Cultural Heritage, including Architectural and Archaeological Heritage	National Heritage Plan 2002 – 2007	Core objective is to protect Ireland's heritage. Plan uses the "polluter pays principle" and the "precautionary principle." Sets out archaeological policies and principles that should be applied by all bodies when undertaking a development.
	The National Monuments Acts (1930 to 2004)	Objectives seek to protect monuments of national importance by virtue of the historical, architectural, traditional, artistic or archaeological interest attaching to them and includes the site of the monument, the means of access to it and any land required to preserve the monument from injury or to preserve its amenities.
	The Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999	Provides for the establishment of a National Inventory of Architectural Heritage (NIAH). The objective of the NIAH is to aid in the protection and conservation of the built heritage, especially by advising planning authorities on the inclusion of particular structures in the Record of Protected Structures (RPS).
	The Planning and Development Act 2000 and amendments to the Act	Under this Act the County Councils are required to compile and maintain a Record of Protected Structures (RPS) in their Development Plans. Sites included in the RPS are awarded automatic protection and may not be demolished or materially altered without grant of permission under the Planning Acts.
	Framework and Principles for the Protection of the Archaeological Heritage (1999)	Objective is to set out for all concerned parties the basic principles and approaches for the protection of the archaeological heritage.
	Policy and Guidelines on Archaeological Excavation (1999)	Objective is to set down policy on licensing of excavations, and guidelines for licensees on strategies and method statements, reports and publications.
	Architectural Heritage Protection – Guidelines for Planning Authorities	Objective is to provide a practical guide for planning authorities and for all others who must comply with Part IV of the Planning and Development Act 2000 on the protection of the architectural heritage and support the effort of protecting Ireland's architectural heritage.
Human Health	Quality of Bathing Waters Regulations 1988 (SI 84 of 1988) and amendments	Prescribe bathing water quality standards and the bathing areas to which they apply, together with the sampling programmes and the methods of analysis and inspection to be used by local authorities to determine compliance with the standards. Give effect to Council Directive No. 76/160/EEC concerning the quality of bathing water.

Topic	Title	Summary of Objectives
Planning	National Spatial Strategy 2002-2020 (2002)	Objectives of the NSS are to achieve a better balance of social, economic and physical development across Ireland, supported by more effective planning.
	National Development Plan 2007 to 2013	Objectives of the NDP are to promote more balanced spatial and economic development.
Sustainable Development	European Communities (Environmental Liability) Regulations 2008 (S.I. 547 of 2008)	These Regulations (SI 547 of 2008) transpose EU Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage. The purpose of these Regulations is to establish a framework of environmental liability based on the 'polluter-pays' principle, to prevent and remedy environmental damage.
	European Communities (Environmental Assessment of Certain Plans and Programmes Regulations 2004 (S.I. 435 of 2004)	Objectives include protection of the environment and integration of plan making processes into the sustainable planning of the country as a whole. The EU SEA Directive was transposed into Irish Law under S.I. 435 in 2004.
	Planning and Development (Strategic Environmental Assessment) Regulations 2004 (S.I. 436 of 2004)	The Regulations concern the consideration of the likely significant effects on the environment of specified plans and programmes. The Regulations prescribe procedures and contents of environmental reporting, monitoring and assessment in relation to each type of plan. A consideration of transboundary environmental effects in specified cases is also made.
Water	Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No 272 of 2009)	Gives legal status to the criteria and standards to be used for classifying surface waters in accordance with the ecological objectives approach of the Water Framework Directive. Establishes environmental objectives for the protection of surface waters. Establishes a wide range of environmental quality standards. Prohibits point and diffuse source discharges liable to cause water pollution except where such discharges are subject to prior authorisation or general binding rules.
	Drinking Water Regulations SI 439 of 2000	Prescribe quality standards to be applied in relation to certain supplies of drinking water, including requirements as to sampling frequency, methods of analysis, the provision of information to consumers and related matters. Give effect to provisions of EU Council Directive 98/83/EC on the quality of water intended for human consumption.
	Local Government (Water Pollution) Act, 1977 (Water Quality Standards for Phosphorus) Regulations 1998 (SI 258 of 1998)	Provide for specified improvements in water quality conditions in rivers and lakes based on phosphorus concentrations or related water quality classifications and give effect to certain requirements arising under Council Directive 76/46/EC on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community.
	European Communities (Water Policy) Regulations (SI 722 of 2003)	Provide for the transposition into Irish national law of the provisions of the EU Water Framework Directive.
	Sea Pollution Act 1991 (SI 27 of 1991) and Amendments 1991 to 2006.	The main international convention on prevention of ship-source pollution is MARPOL 73/78, which regulates for prevention of pollution by oil, dangerous and hazardous substances whether in bulk or packaged, sewage and garbage, and for ships' engines emissions to air. Other convention law provides for prevention of use of toxic or polluting coatings, or paints, on ships' hulls. The Sea Pollution Acts 1991 to 2006, and Regulations made under them, make provision in national law for these matters.

Table 5.4: Preliminary Review of Legislations, Plans, Policies and Programmes – Regional and Local

Title	Summary of Objectives
Strategic Integrated Framework Plan	• Support the multi-functional nature of the Shannon Estuary, and identify opportunities to expand the existing economic base, including port related industry and other related activities; • Facilitate the diversification of the economy, through the promotion of commercial/industrial employment, environmentally friendly aquaculture, maritime, energy, transport, recreation and tourism industries in a sustainable manner; • Protect, manage and enhance the natural coastal environment along the Estuary, including its cultural, natural and built heritage; • Safeguard the Estuary's sensitive environmental resources and natural heritage of national, European and International significance. • Establish an evidence-based approach to identifying areas for future development, to ensure proposals will work in harmony with biodiversity and designated sites including Natura 2000 sites.
Offshore Renewable Energy Development Plan	• The OREDP loos at the potential output from offshore wind, wave and tidal energy nationally. Of particular relevance to Vision 2041 is assessment area 5a relating to the Shannon Estuary. The OREDP adopts a precautionary approach based on developing areas outside all designated nature conservation sites to avoid any potential high level conflict with designation objectives.
Mid-West regional Guidelines	Set clear objectives and targets in relation to the development plans of the planning authorities that are specific in relation to future population, settlement strategy and development distribution and infrastructure investment priorities in line with the NDP 2007-2013. Promote the effective integration and coordination of development plans within an overall regional vision for development.
Draft Mid-West Area Strategic Plan	1. Prioritisation of investment in the region 2. Strengthening The Limerick/Shannon Gateway as the core of the Region. The promotion of the existing city and environs (the metropolitan city) as the economic driver for the region is fundamental 3. Strengthening the Limerick/Shannon Gateway, Nenagh and Ennis as the Hub in terms of population growth 4. Create and support a well defined hierarchy of settlement, as defined in the Mid-West Regional Planning Guidelines, which will support the development of a series of rural economic nodes such as Newcastle West, Thurles and Roscrea 5. Deliver the required transport infrastructure to meet the Plan objectives 6. Optimise the organisational structure to facilitate the delivery of the Plan objectives 7. Provide economic review and direction for the region.
Clare County Development Plan 2011 – 2017	Developing on the Clare County Development Plan of 2005 – 2011, this Plan aims to facilitate the sustainable economic and social development of the county, to conserve the natural and built environment of the county; and to improve Clare's physical infrastructure.

Title	Summary of Objectives
Draft Shannon Town and Environs Local Area Plan 2012 – 2018	This Draft LAP is developed in accordance with the requirements for Local Area Plans as set out within the Planning and Development Acts 2000 – 2010. The Clare County Development Plan 2011-2017 is the 'parent' document for this Draft LAP and thus the Draft LAP is prepared in accordance with the County Development Plan objectives. The Vision for Shannon can be encapsulated by the following statement: 'A town where people want to live and work sustainably and visit because of its strong identity and sense of place, high amenity value and quality of life. A sustainable, low carbon town which continues to be the regional leader for economic development and employment, maximising its strategic location, accessibility and Gateway status'. As outlined under Section 1.2.4 of this report The Draft Shannon Local Area Plan 2012-2018 also contains a number of objectives which highlight the importance of Shannon Airport and how aviation overall, plays a key role in the development of the region. Shannon Airport can be seen as a key enable to boarder catalytic impacts beyond aviation.
Draft South Clare Local Area Plan 2012-2018	The Draft South Clare LAP 2012-2018 is developed in accordance with the requirements for Local Area Plans as set out within the Planning and Development Acts 2000 – 2010 – which introduced a tiered and plan led system. Section 19(2) of the Planning and Development Act 2000 (as amended) sets out that: "a local area plan shall be consistent with the objectives of the development plan, its core strategy and any regional planning guidelines that apply to the area of the Plan and shall consist of a written statement and a plan or plans which may include – a) Objectives for the zoning of land for the use solely or primarily of particular areas for particular purpose; or b) Such other objectives in such detail as may be determined by the planning authority for the proper planning and sustainable development of the area to which it applies, including the objective of development of land on a phased basis and detail on community facilities and amenities and on standards for the design of developments and structures". The draft LAP sets out the land use plan for the proper planning and sustainable development of each settlement in the area of the Plan. The Clare County Development Plan 2011-2017 is the 'parent' document for this Draft South Clare LAP, and thus the Draft Local Area Plan is made in accordance with the goals and objectives as set out in the Clare County Development Plan 2011-2017, including its Core Strategy.
Draft West Clare Local Area Plan 2012-2018	This Draft LAP is developed in accordance with the requirements for Local Area Plans as set out within the Planning and Development Acts 2000 – 2010. The Plan area falls entirely within the administrative area of County Clare and applies to almost the entire electoral area of Kilrush excluding the administrative area of Kilrush Town Council, which is covered by its own development plan. Again, the Clare County Development Plan 2011-2017 is the 'parent' document for the draft West Clare LAP, and thus it is made in accordance with the objectives as set out in the County Development Plan Since the adoption, in 2009, of the current West Clare Local Area Plan 2009-2015 there has been significant changes in the national and regional legislative and planning policy framework. The Planning and Development (Amendment) Act 2010 which came into effect in the intervening time, requires Local Area Plans to be revisited within one year of the making of a County Development Plan. Additionally, in 2010 the Mid-West Regional Planning Guidelines came into effect which set out specific population targets for each zone in the mid-west including West Clare. These targets were transposed directly into the Core Strategy of the Clare County Development Plan 2011-2017. Accordingly having regard to the introduction of the Planning and Development (Amendment) Act 2010, Mid-West Regional Planning Guidelines 2010-2022 and the adoption of the Clare County Development Plan 2011-2017, it is a requirement to revoke the existing West Clare Local Area Plan 2009-2015 and prepare a new LAP for West Clare from 2012-2018.

Title	Summary of Objectives
Ennis and Environs Development Plan 2014-2020	The Vision Statement of the plan in underpinned by the following overall aims: (i) Tp promote sustainable development of Ennis as the principal administrative, economic and social town in County Clare; and to ensure that the town fulfils its role as a designated "Hub Town" in terms of the National Spatial Strategy, and the driver for development of its rural hinterland; (ii) to enable development of Ennis in a sustainable, compact form while conserving the attractive rural setting and landscape of the town and its environs; (iii) To promote the development of Ennis and its environs as a quality environment and destination of choice for work-life balance, economic opportunity, tourism, culture and heritage experience and access to quality services and amenities
Kilrush Development Plan 2008-2014	The overall aim of the Plan is to provide a planning framework which encourages and facilitates the social and economic development of Kilrush in an effort to restrict any future population decline and to facilitate future population growth, whilst protecting and, where appropriate, enhancing the built and natural environment and ensuring development is sustainable and of high quality.
Kilrush Town & Environs Development Plan 2014-2020	The overall aim of the plan is to provide a planning framework which encourages and facilitates the social and economic development of Kilrush in an effort to restrict any future population growth, whilst protecting and, where appropriate enhancing the built and natural environment and ensuring development is sustainable and of high quality.
Limerick Southern Environs Plan 2011-2018	This LAP has been prepared in accordance with the requirements of the Planning and Development Acts 2000 - 2010. The development strategy contained within this LAP is prepared within the context of the Limerick County Development Plan, 2010-2016 which sets a framework for the proper planning and sustainable development of the County. The Limerick County Development Plan 2010-2016 is the 'parent' document for the Southern Environs LAP. Consequently, the LAP is made in accordance with the objectives as set out in the Limerick County Development Plan 2010-2016. In this regard, the following vision statement is put forward: "Limerick County Council will adopt a positive and sustainable approach to balanced development thereby enhancing the lives of people who live in, work in and visit the Southern Environs, whilst protecting the natural and built environment." The objective of this LAP is to guide the future development of the area in line with this policy.
Foynes Theme Town Plan	Foynes has been identified as An Architectural Conservation Area (ACA). The theme town plan concentrates on tourism and town improvements with key recommendations to achieve these goals set out within. One of the key goals of the plan is to achieve the designation of Foynes as a Theme Town by Fáilte Ireland. As a broader objective, the plan is to include an agreed programme of works which must be achieved if Foynes is to reach the standard of environment and to make Foynes a significant tourist destination. This Town Theme Plan is referred to in the Limerick County Development Plan where by all development proposals will have regard to the Foynes Theme Town Plan as published by Limerick County Council.

Title	Summary of Objectives
Askeaton Local Area Plan 2009	Askeaton LAP contains the following Vision Statement: "Askeaton will continue to grow steadily but not rapidly. The town will conserve its rich cultural and natural heritage and this will underpin a successful local tourism industry. Askeaton will have a well balanced, vibrant and integrated community, with good local services and facilities. There will be improved transport that will include a restored railway service to Limerick. There will be full employment with many people working locally." As contained within the Plan the Strategy is to:- "Facilitate and encourage the restoration, consolidation and improvement of the built fabric of the town. Enhance its historic character and riverside setting and exploit the tourism potential of that character. Ensure that infrastructure keeps pace with growth and improve accessibility to services and facilities." The application of this strategy to the next six years has the following components:- • Facilitating implementation of committed development projects, • The building of a new wastewater treatment system for the town, • Concentrating new residential development within walking distance of existing services and facilities, • Facilitating the provision of new services and facilities and concentrating those services in or near the centre, • Protecting and enhancing the character of the historic core of the town, and • Ensuring that there is enough land zoned to offer development choices and the scope for further growth in the future.
Limerick County Development Plan 2010 - 2016	The Limerick County Development Plan was adopted on the 1st November 2010 and came into effect on the 29th November 2010. Variation number 1 to the Limerick County Development Plan 2010 – 2016, which was adopted by the elected members on the 20th December 2011 comprised of the following: A. Amendments to 'Chapter 2: Core Strategy' which consists of replacing section 2.1 to section 2.8 and re-number remaining sections accordingly. B. Amendments to 'Chapter 4: Housing' of the Limerick County Development Plan, 2010-2016 to reflect the inclusion in the County Development Plan of the Joint Housing Strategy for the Administrative Areas of Limerick City and County Councils and Clare Local Authorities, 2010 – 2017. C. Amendments to 'Appendix 1: Settlements' to incorporate zoning maps and development objectives for Fedamore and Montpelier as these Local Area Plans were revoked in September 2011. D. Inclusion of the Joint Housing Strategy for the Administrative Areas of Limerick City and County Councils and Clare Local Authorities, 2010 – 2017. This is contained in a new volume to the plan, Volume 6. "Limerick County Council will adopt a positive and sustainable approach to balanced development thereby enhancing the lives of people who live in, work in and visit the County, whilst protecting the natural and built environment." Vision Statement – Limerick County Development Plan The Limerick CDP 2010 – 2016 sets out the Council's policy to steer future development in the County based on a settlement hierarchy reflecting settlement function and outlines population targets for settlements for the years 2016 and 2022. Ten core strategic planning policies (CP 01 – CP10 – Section 2.12 Limerick Co Development Plan) provide a framework for specific policies and objectives throughout the Plan and underpin the preceding Vision Statement.

Title	Summary of Objectives
Limerick City Development Plan 2010 - 2016	Limerick is the third largest city in the state and as such has a crucial role in the development of national competitiveness and the general economic performance of the Country as a whole. The vision of the Plan is for Limerick City to continue to grow as the centre of economic, social and cultural development for the Mid-West Region. For this to be realised Limerick City must be a cohesive and sustainable community of people; where natural surroundings and important resources are protected; where cultural and built heritage is safeguarded; where opportunities exist that allow people to live and work in a safe environment with excellent public infrastructure and services together with ample cultural and leisure facilities. Three fundamental and interrelated goals underlie all the policies contained in the Plan: 1. To promote and provide for the sustainable development of Limerick City enabling it to fulfill its role as a National Gateway City. 2. To promote social inclusion and to facilitate equality of access to employment, education, transport, suitable housing, social and cultural activities, whether by direct provision (e.g. social housing) or by facilitating others to provide the service (e.g. education). 3. To provide for a high quality natural and built environment and improved quality of life for those living and working in Limerick City and also for those visiting the City.

Title	Summary of Objectives
Kerry County Development Plan 2009-2015	The principal aim of the County Development Plan is to provide for an improved quality of life for all the people in the county while regulating development in a sustainable manner. This can be achieved through the promotion of its social, cultural and employment opportunities, efficient transportation and infrastructure, sufficient housing and community facilities as well as a safe, healthy and clean environment which all contribute to a good quality of life. The County Development Plan promotes the following goals. County Kerry will develop as a place where: Its intrinsic qualities, including social, recreational, cultural and environmental assets, combined with high quality employment opportunities, will provide a unique location and quality of life for its residents and visitors. The settlements will be vibrant and distinctive communities that have individual roles and provide for the social, economic and employment needs of their residents and rural catchment. They will develop as attractive locations in which to live and work and will provide a broad range of residential options. The high quality of urban design, and the multi-disciplinary input required, shall be such as to create a high quality working, amenity and residential environment for the occupants of each settlement. In addition development shall serve to enhance the urban environment and make the settlement more attractive for its residents and visitors. Rural depopulation will be countered through the provision of a network of viable vibrant settlements providing the services necessary to sustain the rural population. The infrastructure, environment and the coordinated support of all agencies for the creation of employment opportunities, particularly in indigenous creative and knowledge based industries, will be a priority underpinning the future development of the County. The Irish language will be preserved and promoted as a living daily-use language and Gaeltacht communities will be supported in order to strengthen and expand the social networks that nourish Irish as the community language. The negative effects of peripherality will be minimised through the provision of adequate infrastructure and high quality communications. New development will contribute to the goals of sustainable development, including: • Respecting the existing natural, built and cultural character of the County, including the open countryside; • Making best use of existing social and physical infrastructure; • Contributing to the provision of high quality social infrastructure within settlements. • The resilience of the county to adverse external factors will be minimized through promotion of greater security for the quality of life of its citizens. • The reduction of greenhouse gas emissions will be an integral part of development management and policy formulation. • The biodiversity of the natural environment will be protected and promoted
Tarbert Local Area Plan	This Plan is prepared in accordance with S.20 of the Planning & Development Act 2000. The plan is consistent with the policies, provisions and objectives of the Co. Development Plan, National Guidelines, and Kerry Co. Development Board policies. This plan, in conjunction with the Kerry Co. Development Plan, will provide the framework for future development decisions and will remain in effect for a period not exceeding 6 years from the date of adoption. As espoused by the Plan, the development strategy for Tarbert is to enhance the town's physical assets and promote economic growth. To attract residents and tourists, development should be of a high visual and architectural standard. The plan also provides for the protection of scenic and wildlife areas.
County Clare Heritage Plan 2011-2017	The Clare Heritage Plan 2011-2017 sets out how Clare County Council, in association with other stakeholders, will identify manage and conserve heritage for the benefit of all. It will collect and make available heritage information and raise awareness through education initiatives, surveys and research. It will inform public policy on heritage and support the strategic and integrate management of heritage at a local level.

Title	Summary of Objectives
Kerry County Council Heritage and Biodiversity Plan 2008-2012	The Kerry County Council Heritage and Biodiversity Plan has three key Performance Areas. 1). Education and Access 2). Research 3) Management. It looks at a series of policies (8), aims (10) and actions (7) within three key performance areas; a) Built Heritage b) Natural Heritage and Biodiversity c) Museums, Archives and Archaeology.
Limerick County Heritage Plan 2005 - 2011	The aim of the Limerick County Heritage Plan is to set out a vision for the conservation and sustainable management of heritage in Limerick for the future, and to encourage community responsibility in its implementation. A key element of the plan is a call for the preparation of Local Heritage Plans at County and City level. The actions address eight broad objectives which aim to conserve and sustainably manage our heritage and to encourage a sense of shared responsibility for our heritage in the whole community.
Limerick City Biodiversity Plan	To maintain, protect and enhance the biodiversity of Limerick City for the future generations and to educate and promote the importance of Limerick City's biodiversity for all.
Clare Biodiversity Action Plan	The development of a biodiversity Action Plan was a key action under the Clare Heritage Plan, it aims to conserve the biodiversity of County Clare by prioritising, co-ordinating and initiating action to ensure the effective conservation and enhancement of biodiversity in County Clare and by raising awareness and appreciation of local biodiversity, through involving local communities in its conservation and by informing policy.

6 SEA ENVIRONMENTAL OBJECTIVES, TARGETS AND INDICATORS

6.1 INTRODUCTION

The SEA Directive does not require objectives to be developed for the SEA itself, but these are widely used in SEAs to ensure that the appropriate level of consideration is achieved (ODPM, 2005). However, as this SEA for the SFPC Vision 2041 plan is employing a baseline led assessment approach, we will use SEA objectives to test the environmental effects of the plan and to compare the effects of the alternatives.

6.2 DEVELOPMENT OF STRATEGIC ENVIRONMENTAL OBJECTIVES, TARGETS AND INDICATORS

The SEA objectives, targets and indicators of this environmental report are shown in **Table 6.1** and reflect the nature of Vision 2041. Targets set in this SEA must be attributable to the implementation of the Plan, so they reflect the positive and negative effects.

Environmental indicators are used to track the progress in achieving the targets set in the SEA as well as the Plan itself. The indicators have been selected bearing in mind the availability of data and the feasibility of making direct links between any changes in the environment and the implementation of the Plan.

Table 6.1: Strategic Environmental Objectives, Targets and Indicators

SEA Topic	SEA Objective	SEA Target	SEA Indicators
Biodiversity, Flora & Fauna	**Objective 1** Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU and nationally designated habitats, sites and species. Improve local biodiversity if possible.	• No deterioration of habitats or their associated species due to implementation of Vision 2041. • No increased spread of Alien Species and their associated impact to the aquatic environment due to implementation of Vision 2041.	• Status of EU Protected Habitats and Species and status of national Priority Species and Habitats. • Geographical spread and number of Alien Species in the area. • Condition of Selection Features in sites designated for nature conservation (SACs, SPAs and NHAs).
Population	**Objective 2** Provide an economic boost for the region and contribute to environmentally sustainable development.	• Increased investment in the region. • Increased tourism levels in the region. • Increased employment opportunities in the region.	• Number of new businesses established near to the SFPC facilities. • Number of tourist visits to the region. • Unemployment statistics in the region.
Human Health	**Objective 3** Prevent public nuisance from port activities and provide safe working area with no risk to human health.	• Increase if possible, numbers of cruise ships calling at Foynes Port. • Prevent nuisance dust and odours emanating from port activities.	• Number of tourist visits to the region. • Number of accidents associated with SFPC facilities. • Health issues and nuisance complaints associated with port activities.
Soils	**Objective 4** Avoid damage to the function and quality of the soil resource in the study area.	• Avoid sterilisation of a usable or natural soil resource.	• Area and zoning of land use from SFPC infrastructure. • Encroachment into areas of non industrial / commercial land.
Water	**Objective 5** Development and operation of SFPC facilities not to cause deterioration in water status of any waterbodies.	• No deterioration of water status up or downstream of SFPC facilities, due to development or operation.	• WFD water status of surface and groundwaters in the area.
Air Quality	**Objective 6** Minimise emissions to air as a result of development and operation of SFPC facilities.	• No exceedences of air quality standards due to SFPC facility development or operation. • No significant increase in background air pollutant levels in the region of SFPC facilities, due to the implementation of the Plan. • Compliance with odour and dust criteria to prevent deterioration in amenity.	• Air quality/air pollutants levels at SFPC facilities and Zone D in general. • Increased road and boat traffic in the area. • Increase in number of odour and dust complaints, because of development or operation.

SEA Topic	SEA Objective	SEA Target	SEA Indicators
Climatic Factors	**Objective 7** Minimise contribution to climate change by emission of greenhouse gasses associated with development and operation of SFPC facilities.	• Minimise GHG emissions from development and operation. • No net loss of CO2 sequestering vegetation in the area. • Employ BAT and renewable energy within development and operation of facilities where possible.	• GHG emissions in the region. • Use of "green energy" in the operation of SFPC facilities. • Port energy use.
Material Assets	**Objective 8** Develop SFPC facilities and provide vehicle for development of new sustainable infrastructure for the region.	• Develop SFPC facilities at Foynes and Limerick. • Maintain operations at all SFPC facilities. • Provide vehicle for investment in local infrastructure.	• Number and extent of facilities at Foynes and Limerick. • Capital invested in local infrastructure. • Augmentation of local infrastructure, e.g. number of new roads built, old roads updated, treatment plants updated etc, due to Plan.
Cultural Heritage (inc. Architectural and Archaeological)	**Objective 9** Avoid damage to cultural heritage features during development and operation of SFPC facilities.	• Restore port related cultural heritage features. • Provide public access to cultural heritage features within SFPC lands where appropriate. • Avoid damage to any cultural heritage features in development and/or operation of SFPC facilities.	• Number of heritage features restored as part of Vision 2041. • Number of new heritage features discovered in the Vision 2041 timescale. • Number of heritage features accessible to the public for educational purposes. • Number of heritage features lost or destroyed due to the implementation of Vision 2041.
Landscape	**Objective 10** Avoid damage to local landscape and vistas.	• No damage to local vistas and landscape in the area of SFPC facilities. • Enhance the local vistas and landscape where possible, with sensitive and sustainable development practices.	• Significant negative changes in land cover types. • Percentage changes in land cover types in areas with a high sensitivity to change. • Changes in landscape character definitions.

7 ALTERNATIVES

7.1 INTRODUCTION TO PROPOSED ALTERNATIVES

The alternatives available to the SFPC Vision 2041 plan take the form of various levels of development at the Port of Foynes and/or the Limerick Docks. This plan does not go into any further detail on potential development of the facilities at Tarbert, Moneypoint, Aughinish and Shannon Airport. The development of these facilities is dependent on the Shannon Strategic Integrated Framework Plan. Each of these alternatives have been assessed as a standalone alternative, however if Vision 2041 is implemented with a combination of these alternatives then there may be cumulative impacts, which are assessed in **Section 8**. **Figure 7.1** shows the locations of the various alternatives proposed for the Port of Foynes.

Alternative 1 – This is the "Do Nothing" alternative, whereas Vision 2041 is not implemented and there are no changes in workings or developments at the SFPC facilities.

Do Nothing Port of Foynes

Vision 2041 states that it is possible that the Port of Foynes could continue to operate in its current form and function, serving its existing market sectors. However, having regard to the competitive dynamics within the overall Irish market, it is likely that the Port of Foynes would begin to lose significant market share to other port operators in Dublin and Cork, as operations become inefficient. SFPC is identified as one of the three core ports in Ireland and national policy indicates that much of the port capacity in Ireland should be provided at these three key locations. In parallel the Harbour's Act 1996 fostered a competitive and commercial regime within the Irish ports sector and under this legislation SFPC is obliged to operate as an enterprise with a clear and defined commercial mandate. Vision 2041 states that due to national policy, legislative requirements and even using a Medium Growth Scenario up to 2040, SFPC cannot afford to sit still if it is to remain competitive in a sector comprising significant inter port competition. It is considered that the 'do nothing scenario' is not a viable or practical option.

Do Nothing Limerick Docks

Vision 2041 states that Limerick Docks could continue to operate in its current form and function, providing a service to the Limerick Port Users, a group of locally based companies currently importing and exporting goods. The current operation effectively utilises circa 11 hectares (Ted Russell Docks) of the Port Estate (75.1 hectares) for port related activity. Vision 2041 continues to say that whist this scenario is viable and attractive in its own right, it fails to consider the use of the remaining land within the Port Estate which is under utilised, vacant or undeveloped and in the ownership of SFPC. Vision 2041 states that the Limerick Docks will be unlikely to experience the same predicted growth in bulk solid business as the Port of Foynes, mainly due to the distance of the facility upstream from the mouth of the Estuary, the limited navigational depths and the urban context of the Docks location.

Alternative 2 – Effective Utilisation of Existing Assets, whereas SFPC use all the facilities to their full potential over the short, medium and long Term.

Effective Utilisation Port of Foynes

Vision 2041 states that in the case of the Port of Foynes all existing tenants and activities are dependent upon port infrastructure and shipping and therefore 'managing out' existing users to make available additional land within the Port Estate is not an option. Investment has already taken place in the refurbishment and redevelopment of outdated premises and it is proposed to upgrade/replace the existing 5,109sqm of warehousing, thereby further optimising existing assets. An examination of work practices and procedures has also been undertaken to ensure optimal use of existing port assets. The Port of Foynes currently operates every day (except for Christmas Day) from 06.00 – 24.00hrs with an average working day of between twelve and sixteen hours. Whilst there is potential to operate on a twenty four hour basis to optimise the use of assets, the increase in working hours is heavily dependent on third parties and their customer base being willing and capable. The liquid fuel sector is the only area expected to progress to a twenty four hour operation to supply the customer. The dry bulk and break bulk sector is expected to increase to a maximum of a sixteen hour day operation for the turnover of cargo that is stored within the port estate. The reality is that working hours will in all likelihood fluctuate between twelve and sixteen hours per day and SFPC has found such work practices effective to date. The other element of shore-side facilities which needs to be examined is cargo-handling equipment, notably craneage and ancillary equipment, in order to ensure that rates of loading and discharge are optimised. In this regard SFPC makes continuous investment in its equipment to ensure optimal operating rates are achieved.

Effective Utilisation Port of Limerick Docks

Vision 2041 states that whilst the Port Estate comprises 75.1 hectares, existing port operations only utilises circa 11 hectares (Ted Russell Dock). Whilst a significant area of land is in third party ownership and is utilised for non port related activities, some 15.12 hectares of land, in the ownership of SFPC, has been identified as surplus to current operational requirements. These 15.12 hectares of land comprises four distinct sites including undeveloped greenfield sites, vacant brownfield site, underutilised and vacant buildings. Whilst some of the undeveloped land shall be utilised to accommodate additional warehousing as the need arises, there is a substantial land bank that is surplus to port operation requirements.

Alternative 3 – Port of Foynes Estate Expansion. The Port of Foynes currently has 10ha of land spare for development and needs 127ha to accommodate anticipated growth (high growth scenario). Expansion would have to be landward to the south east. This would take place in the medium and long term.

Vision 2041 states that the Port of Foynes has only 10 hectares of undeveloped/unoccupied land remaining within its existing Port Estate. However this land is dispersed throughout the estate comprising three small parcels with the largest no greater than 7 hectares in area. Whilst this land

could be used to accommodate some warehousing requirement it is inadequate to meet the requirements of specialist projects related to renewables, energy, industrial and/or the ocean energy sector. In order to accommodate projected tonnage throughput it has been estimated that some 127 hectares of additional lands will be required to facilitate port operations up to 2040 (high growth scenario). In addition to the existing 10 hectares within the Port of Foynes, the Limerick County Development Plan has identified an additional 28 hectares of land for industrial use associated with the expansion of port activities. Excluding the existing zoned and undeveloped land in and adjoining the Port, there is still requirement for an additional 89 hectares of suitability zoned land required for industrial use / port related activities in an around the Port of Foynes. Careful consideration must be given to the spatial location of such land particularly having regard to the provision of existing services and facilities including connection to the rail network.

Of further consideration Vision 2041 acknowledges the sensitive environment surrounding the Shannon Estuary and the Robertstown River and the need to take environmental considerations into account including amenity designations. Other issues including land ownership and the need to successfully negotiate with third parties, topography and physical constraints are also important factors, all influencing the potential location of the port expansion area. Vision 2041 demonstrates the opportunities and constraints influencing the consideration of a port expansion area and highlights that the only logical expansion area is to the south east of the existing port. Expansion of port activities to this area, whilst dependant on further environmental and topographical surveys along with third party land negotiations, is ultimately dependant on securing appropriate zoning and support from Limerick County Council in their County Development Plan.

Alternative 4 – Port of Foynes Remote Operations. This alternative looks into the long term with many Port related activities being carried out remotely, with the most likely location being Askeaton Business Park.

Vision 2041 states that the use of off-site land for port related purposes would be of potential benefit where such land has an operational linkage with port operations and logistics, and can be identified and delivered. Remote sites could usefully contribute to the unidentified land requirement for renewables and / or off-shore activity or ocean energy related developments. Whilst SFPC will continue to monitor the availability of sites that may be suitable for remote opportunities, ultimately acquisition and implementation will be dependent upon agreement with local stakeholders.

The Askeaton Business Park is strategically located on the National Road Network (N69) and only 7km east of the Port of Foynes with railhead access on the Foynes-Limerick route. The business park, which is in state ownership, comprises over 92 hectares of land appropriately zoned for industrial and employment use. The site has been identified as an important site from a business and employment perspective for County Limerick and the wider region in the Draft Mid West Area Strategic Plan, the Mid-West Regional Planning Guidelines and the Limerick County Development Plan. However, significant road alignment improvements are required between Askeaton and Foynes for this site is to become a real contender in accommodating port related activities into the future.

Alternative 5 – Port of Foynes – Additional Berthing Facilities at Foynes. Short term planning, followed by medium and long term development.

Whilst existing berthing facilities at the Port of Foynes may be adequate for the present time, the anticipated growth in tonnages quoted in Vision 2041 and the correlating berth occupancy predictions indicates the need for new berthing facilities in the medium term. Having regard to commercial, economic and environmental considerations, and given the long lead time for port related development, there is a need to plan for such facilities now and to commence an investigation of options. The inner port area of Foynes comprises of two distinct jetties including the western jetty and the eastern jetty, both which need to be evaluated in terms of additional berth provision. SFPC acknowledge in Vision 2041 that operational and physical constraints exist in the inner port area requiring substantial investment to service parcel sizes ranging from 3,000 – 4,000 tonnes. Subject to capital appraisal, SFPC commit in Vision 2041 to invest in this facility over the short, medium and long term.

Alternative 6 – Port of Foynes – Deep Water Berthage to accommodate Panamax Vessels at one of four potential locations, being Foynes Port Inner Harbour, Foynes Port Western Harbour, Foynes Island and Mount Trenchard. Foynes Island however is the only really suitable location. Short term planning, followed by medium and long term development.

The size of vessel calling at Foynes is limited to a 10.5m draft and 200m length. Vision 2041 comments on how internationally the trend towards larger vessels is clearly evident, and if SFPC are to remain competitive in this international context, significant investment is required in this area. The consultation phase of the Vision 2041 highlighted that a Panamax capability should be provided as close as possible to existing customer facilities at Foynes. This requirement, outlined by the port users, is considered an important parameter, particularly given that the success of new facilities will ultimately depend on customer uptake. SFPC proposes to provide new deepwater berthage capable of facilitating Panamax vessels and next generation Panamax. There are four potential deep water options in Foynes to accommodate larger vessels including:

- Foynes Port Inner Harbour
- Foynes Port Western Harbour,
- Foynes Island; and
- Mount Trenchard.

A preliminary technical evaluation of these options concluded that Foynes Island and Mount Trenchard are the only sites within the Foynes Port area and its environs capable of safely facilitating Panamax vessels. Foynes Port Inner and Western Harbours were deemed unsuitable primarily due to existing harbour limitations and particularly the manoeuvrability requirements for Panamax or next generation Panamax vessels between Barneen Point and Colleen Point. The Port of Foynes Western Harbour is

also unsuitable on navigational and safety grounds. Furthermore, the berthing/ unberthing stage of a Panamax vessel under either of these scenarios would impact on other ship movements in the Port.

Mount Trenchard was subsequently deemed unsuitable due to its location and the potential of substantial intertidal interruption. The N69 runs adjacent to the southern boundary of Mount Trenchard and all land would require reclamation from the Estuary. It was decided that the implications of this reclamation would present substantial ecological and amenity concern, and there is no potential for rail connectivity to Mount Trenchard due to the topographical variations between the rail head in Foynes and the Mount Trenchard location.

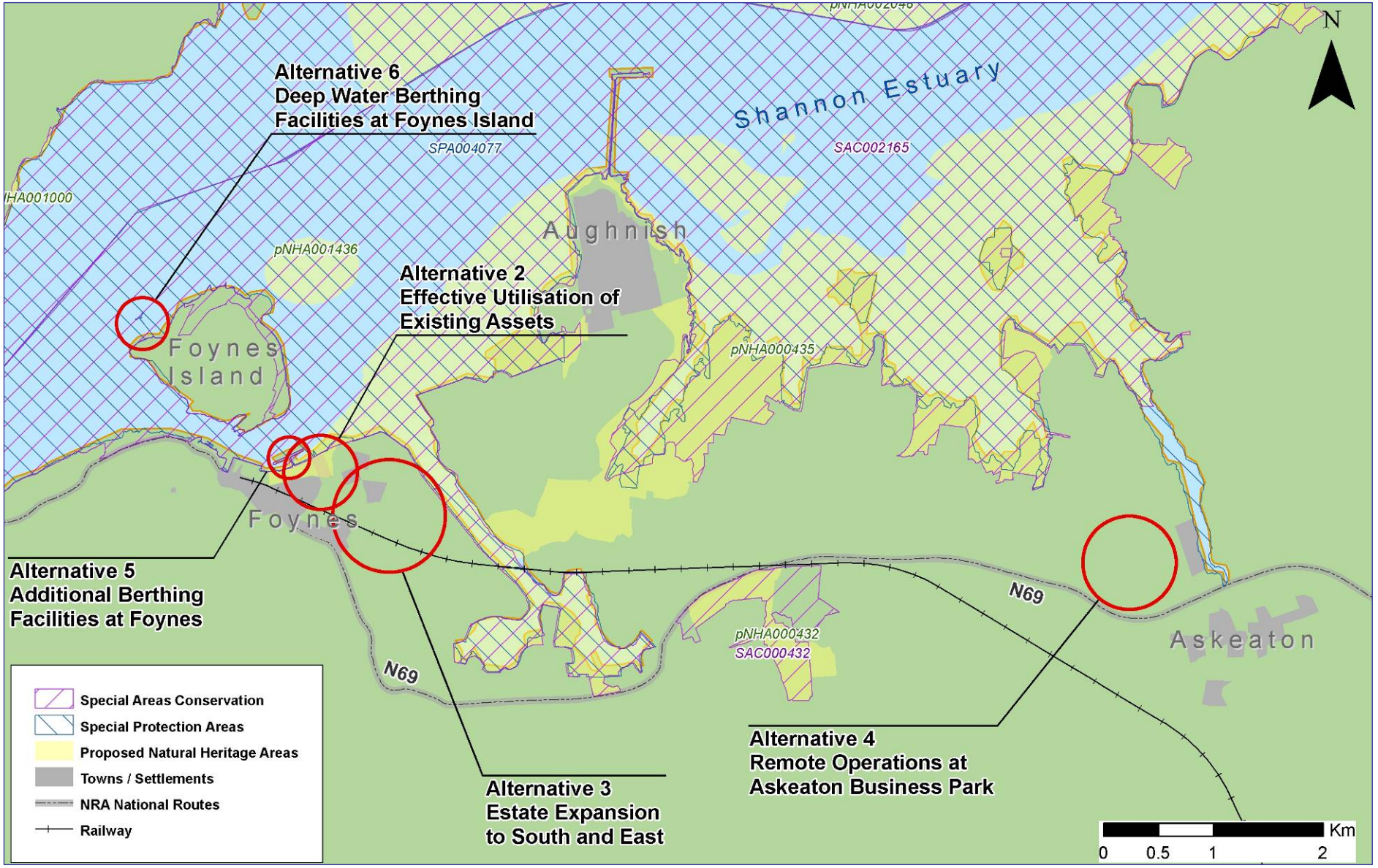
Foynes Island was selected as the preferred option from a navigational and capacity perspective. With extensive access to natural deep water (occurring between 12.5m to 20m depths) the island provides immediate access to the main navigation channel of the Estuary with no capital or maintenance dredging required. The Island has traditionally facilitated port operations, as until the late 1970's an oil jetty was operational on the Island, utilising a deep water berth that still exists on the north western side of the Island, which was supported with infrastructural connections to the main port.

Alternative 7 – Limerick Docks – Future Use of Non Core Assets. Four sites have been highlighted for development throughout the medium and long term:

- Site 1 – Corcanree Business Park;
- Site 2 – The Wishbone;
- Site 3 – Bannatyne Mills, and
- Site 4 – Sailors House.

The docklands area is identified in the Limerick City Development Plan 2010 – 2016 as an under-utilised asset for the future economic development of the City and the City Region. The Limerick City Plan fully supports the retention of the Port and development of the surrounding lands as a strategic employment location within the City (Policy EDS.3). The four distinct non core assets which are named above are in the ownership of SFPC and are presently underutilised. Each of these sites is being assessed as a separate alternative.

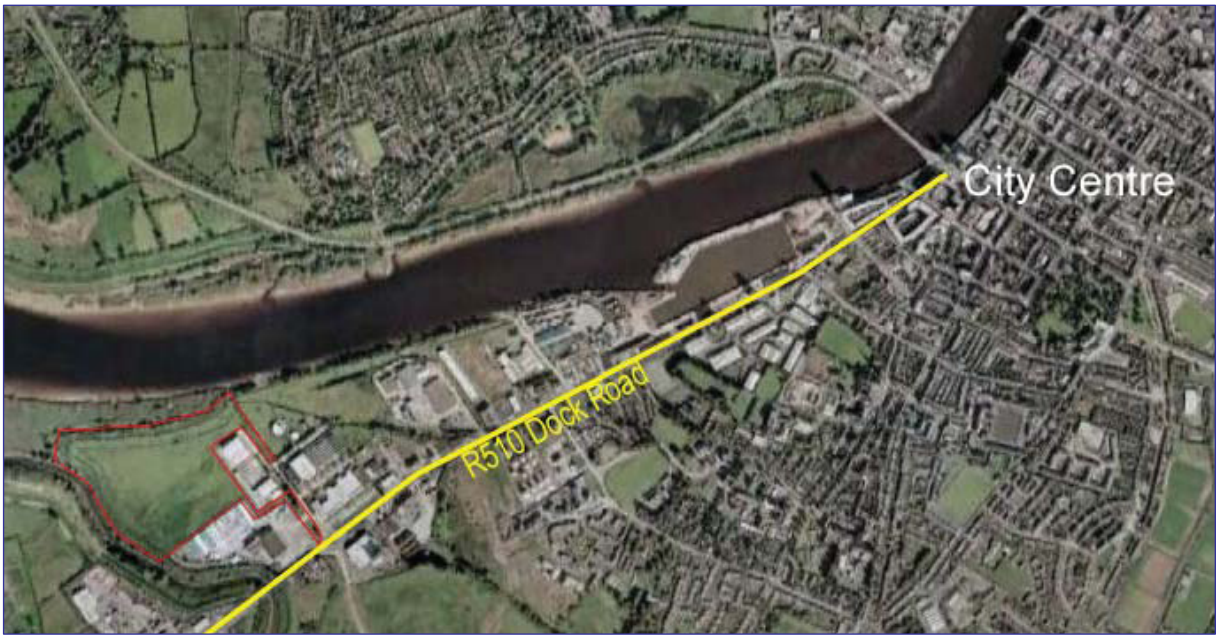
Figure 7.1: Port of Foynes Vision 2041 Alternatives



Alternative 7a – Site 1 – Corcanree Business Park

This site is a substantial greenfield undeveloped site which is located at the north west corner of Corcanree Business Park. The River Shannon bounds the site to the north and the Ballynaclogh River defines the site to the west. Grassland Fertilisers adjoins the site to the south whilst Dutec Optical Disks occupies a substantial portion of the eastern boundary. The site is 11.73 hectares and is zoned for Mixed Use Development. This zoning gives it the permissible uses of general offices, education, commercial leisure, residential, public institutions, health services, business, light industrial uses and community/civic uses. There is direct access to the site via an internal road within the business park which has direct access onto a roundabout on the R510 Dock Road just east of the Dock Road Interchange providing linkage to the M7, M20 and M18. The site is serviced adequately with water and sewerage facilities. Corcanree Business Park is shown in **Figure 7.2**.

Figure 7.2: Site 1 – Corcanree Business Park

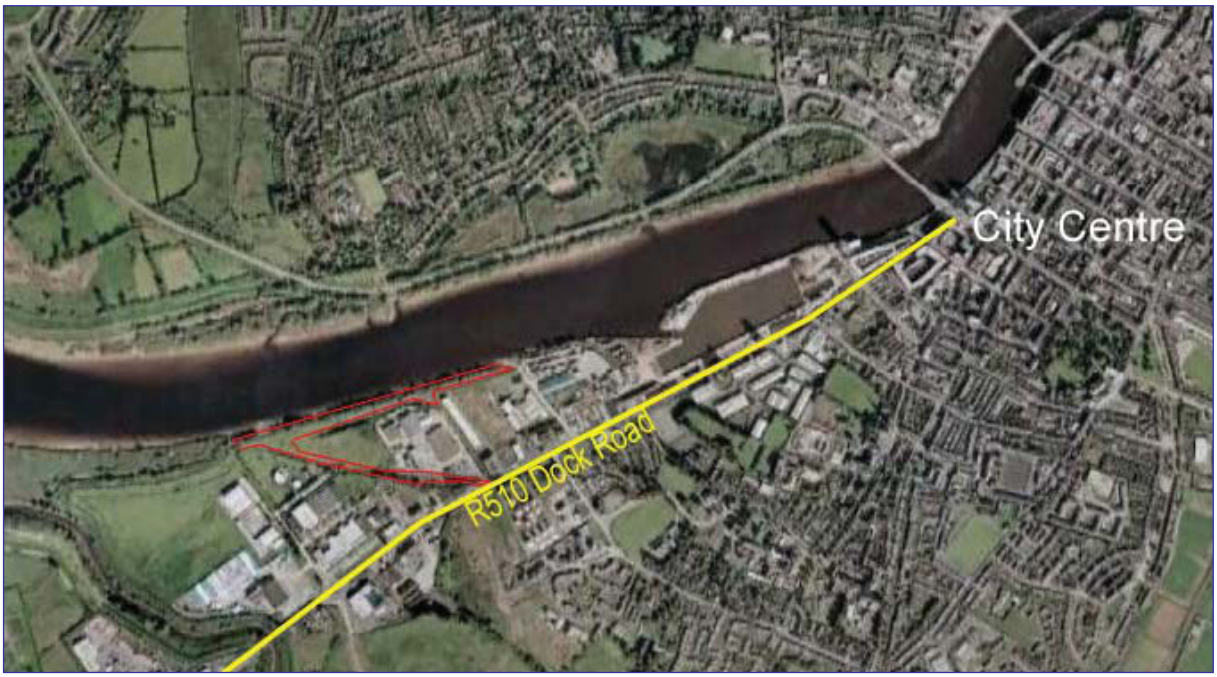


The Corcanree Business Park is located within the Grassland Fertiliser Seveso site consultation distance, within a designated Flood Zone A area, and it is adjoining the Shannon Estuary SAC and SPA designations. A wayleave is maintained by Limerick City Council which runs in an east – south west direction through the site. There is no planning history on the subject site and there is no specific planning policy affecting the land. The general area is identified as a strategic employment location in the Limerick City Development Plan. The development potential most suited to the site is light industrial / commercial use, reflective of existing surrounding uses. Potential direct access to Ted Russell Docks is via Site 2 – The Wishbone. This is the last greenfield site remaining in the Corcanree Business Park and is the only undeveloped commercial / industrial site located in such close proximity to the city centre, whilst also having direct linkages to the national road network.

Alternative 7b – Site 2 – The Wishbone

The Wishbone comprises of two narrow strips of land of 3.12 ha in total which come together in a v-shape (wishbone) appearance, meeting at the north eastern corner of Site 1 within Corcanree Business Park. One part of the land extends from Site 1 to Atlas Avenue along the northern boundary of the Port Estate adjoining the embankment of the River Shannon. The other leg runs south east from the R510 Dock Road to the north western corner of Site 1, sandwiched between existing industrial and commercial developments. The land is zoned for mixed use development and the permissible uses include general offices, education, commercial leisure, residential, public institutions, health services, business, light industrial uses and community/civic uses. Access to the land is directly off the N69 Dock Road or via Atlas Avenue. There are services available to the site. The Wishbone Site is shown in **Figure 7.3**.

Figure 7.3: Site 2 – The Wishbone



The site is located within the vicinity of the Grassland Fertiliser and Irish Shell Seveso sites consultation distance, flood zone A area, it adjoins the Shannon Estuary SAC designation and partially adjoins the SPA designation. There are no wayleaves accessing the site and there is no planning history on the site. There is no specific planning policy affecting the land and the general area is identified as a strategic employment location in the Limerick City Development Plan. The development potential is limited for the site as the configuration of the land makes it unsuitable for development in its own right. The land however does provide for good connectivity within and throughout the Port Estate and could be used to enhance connectivity with Ted Russell Dock and facilitate development on Site 1.

Alternative 7c – Site 3 – Bannatyne Mill

The Bannatyne Mill is a former corn store, five-stories high with a floor area of 3,129sqm, built between 1873 and 1874, and is a rare example of Victorian industrial architecture. The building faces onto the R510 Dock Road and onto a large industrial site which gives access to the wet dock. The Bannatyne Mill is technically significant as the building's frame is made of cast-iron and is encased in cut stone and rubble. The site is zoned for mixed use development with permissible uses of general offices, education, commercial leisure, residential, public institutions, health services, business, light industrial uses and community/civic uses. The access to the site is via two locked gates immediately adjacent to the mill building to the west and east which provide direct access onto the R510 Dock Road. The building can also be accessed via the primary entrance to the Docks which is located further east along the N69. There is adequate area within the cartilage of the building to accommodate on site car parking. Services are available at the site. The site location is shown in **Figure 7.4**, while a picture of the building is shown in **Plate 7.1**.

Figure 7.4: Site 3 – Bannatyne Mill

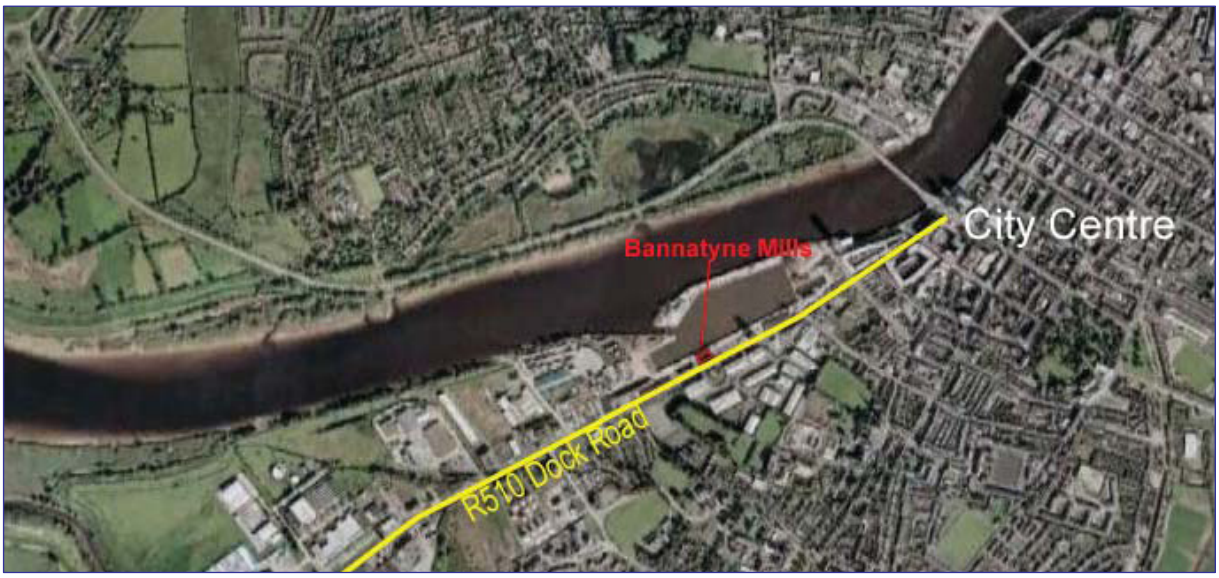


Plate 7.1: Bannatyne Mill

The Bannatyine Mill is a listed building on the Register of Protected Structures for Limerick City. It is listed on the National Inventory of Art and Heritage and is rated to be of regional importance. The site is located within a designated flood zone A area, and it adjoins the Shannon Estuary SAC designation and partially adjoins the SPA designation. There are no rights of way or wayleaves at the site. The only planning history on this site relates to signage. There is no specific planning policy affecting / restricting the building. Any development permitted would need to be undertaken in accordance with best conservation standards and principles.

The building has enormous development potential and could be used for multiple purposes, with potential commercial/civic use on the ground floor and office / residential use overhead. Alternatively, the building could be utilised as a 'flagship' office for an FDI company looking to locate in a regenerating area in proximity to the city centre. This building will however require significant investment and refurbishment, and therefore could benefit from formal designations and financial incentives such as the research cluster designation. Opportunities must also be explored in relation to the possible synergistic opportunities that could potentially arise with neighbouring activities such as the University of Limerick and the Mary Immaculate Third Level Institution.

Alternative 7d – Site 3 – Sailors House

Sailors House is a classical two storey rendered building set back from the road on its own defined site. Constructed in 1856 the house is of significant historical interest. It neighbours existing residential property to the south. The building is 432sqm and the site is 0.17 hectares. The site is zoned as inner city residential neighbourhood zoning, which seeks to reinforce the residential character of inner City residential neighbourhoods, while supporting the provision and retention of local services, and civic and institutional functions. Access to the site is directly via O'Curry Street, south of Limerick Docks, and there is adequate space to accommodate on site car parking. The building is fully serviced. The location of site 4 is shown in **Figure 7.5** and a photograph of Sailors House is shown in **Plate 7.2**.

Figure 7.5: Site 4 – Sailors House

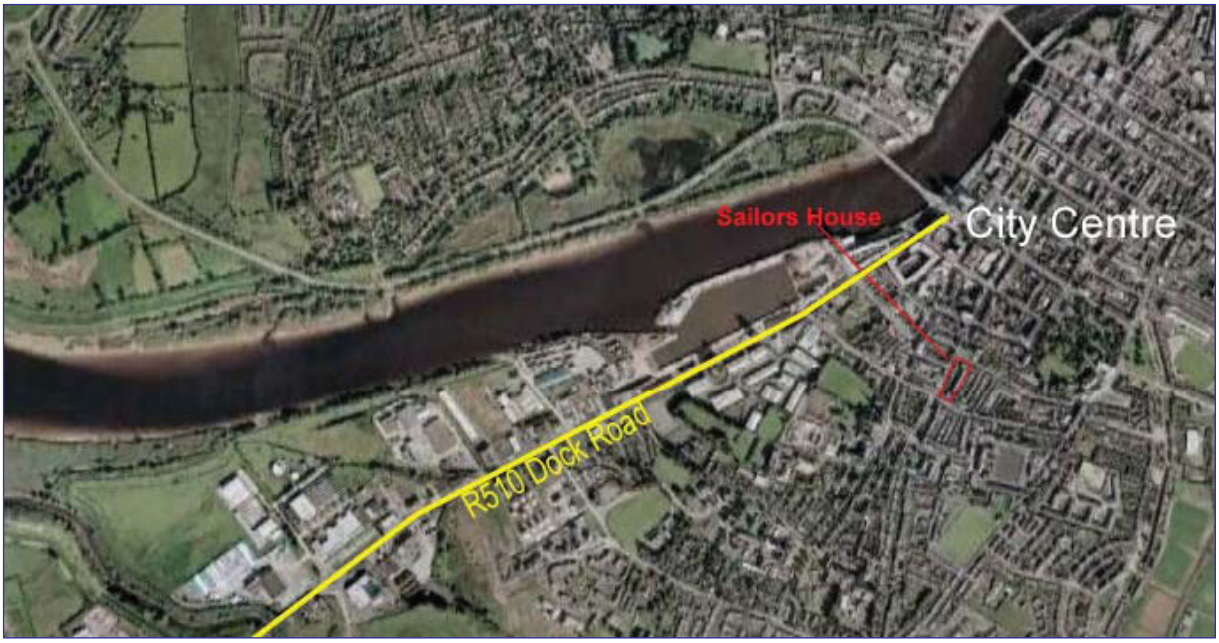


Plate 7.2: Sailors House

Sailors House is a listed building on the Register of Protected Structures for Limerick City. There are no rights of way or wayleaves at the site. The site has secured planning permission for a change of use from a Garda Barracks to office use in 2011 (planning reference 11/138). There is no specific planning policy affecting / restricting the building. Any development permitted would need to be undertaken in accordance with best conservation standards and principles.

The building has enormous development potential and could be used for multiple purposes, including office / commercial use, either in single use or subdivided into multiple uses such as serviced office suites. Significant refurbishment and maintenance work has already been undertaken on this building and the recent planning permission granted for office use is significant in the context of its location and landuse zoning.

8 ASSESSMENT

The environmental assessment of the non implementation of Vision 2041 with Alternative 1 or the implementation of Vision 2041 with Alternatives 2 to 7 are given in the following section. The assessments are carried out by environmental baseline categories and are assessed to give the positive and negative effects, their significance and permanence, any secondary, cumulative or synergistic effects, and any inter-relationship of effects. Associated with each Alternative is an impact summary table.

8.1 ALTERNATIVE 1 - DO NOTHING

An overview of the evolution of the environment in the absence of the Plan is given in **Section 4.2**. Below is a more detailed assessment of this, to provide an approximation of what would happen in the study area if the Plan were not implemented, i.e. The Do Nothing option.

8.1.1 Biodiversity, Flora and Fauna

In the short term without the implementation of Vision 2041 the biodiversity, flora and fauna of the study area would continue to exist in the same pattern, abundance and density as today. In the medium and long term it is likely that the environmental designation areas within the study area will remain as wildlife refuges, however there may also be continuing pressures applied to the non protected natural environment from increased population levels and development encroachment. However non-implementation of Vision 2041 is unlikely to have any significant effects on biodiversity, flora and fauna in the study area.

8.1.2 Population

In the short and medium term non-implementation of Vision 2041 is unlikely to have any significant effects on the population levels in the study area and will provide no changes to the existing economics of the area. In the long term however there is the potential that the SFPC facilities will not be able to compete with other similar facilities and there is therefore the potential for the loss of contracts and subsequently the loss of jobs, which would be a significant negative effect.

8.1.3 Human Health

In the short, medium and long term it is unlikely that there will be any significant positive or negative effects on human health due to non-implementation of Vision 2041. The SFPC will still be required to operate to all health and safety standards and will still be responsible for controlling public nuisance from port activities.

8.1.4 Soils and Geology

In the short, medium and long term it is unlikely that there will be any significant positive or negative effects on soils and geology in the study area due to non-implementation of Vision 2041.

8.1.5 Water

In the short, medium and long term it is unlikely that there will be any significant positive or negative effects on water quality and quantity in the study area due to non-implementation of Vision 2041. Existing port activities will have to comply with enacted legislation such as the Water Framework Directive, and thus cannot cause the deterioration of water status in the area.

8.1.6 Air and Climate

In the short, medium and long term it is unlikely that there will be any significant positive or negative effects on air quality in the study area due to non-implementation of Vision 2041. Not implementing Vision 2041 is also unlikely to have any impacts on climatic factors, however in the long term, if current climate change predictions are correct, the existing SFPC facilities may not be suitable for rising water levels, flash flooding and general disrupted weather patterns. This could lead to negative impacts for the port operations.

8.1.7 Material Assets

Without the implementation of Vision 2041 there is unlikely to be any noticeable impacts on material assets in the study area in the short term, as SFPC facilities operate as normal. In the medium and long term however the inability of the SFPC to adapt its facilities to changing operational requirements and new technologies there will most likely be the loss of contracts, reduced imported tonnages at the facilities and then subsequently less development in the region. Non implementation of Vision 2041 could therefore lead to significant negative effects in the long term.

8.1.8 Cultural Heritage, including Archaeological and Architectural Heritage

In the short, medium and long term it is unlikely that there will be any significant positive or negative effects on Cultural Heritage, including Archaeological and Architectural Heritage in the study area due to non-implementation of Vision 2041. There is the possibility however that by not implementing Vision 2041 that the Bannatyne Mill and Sailors House are never properly re-used or restored leading to them being beyond repair and lost forever. This could therefore potentially be a slightly negative impact.

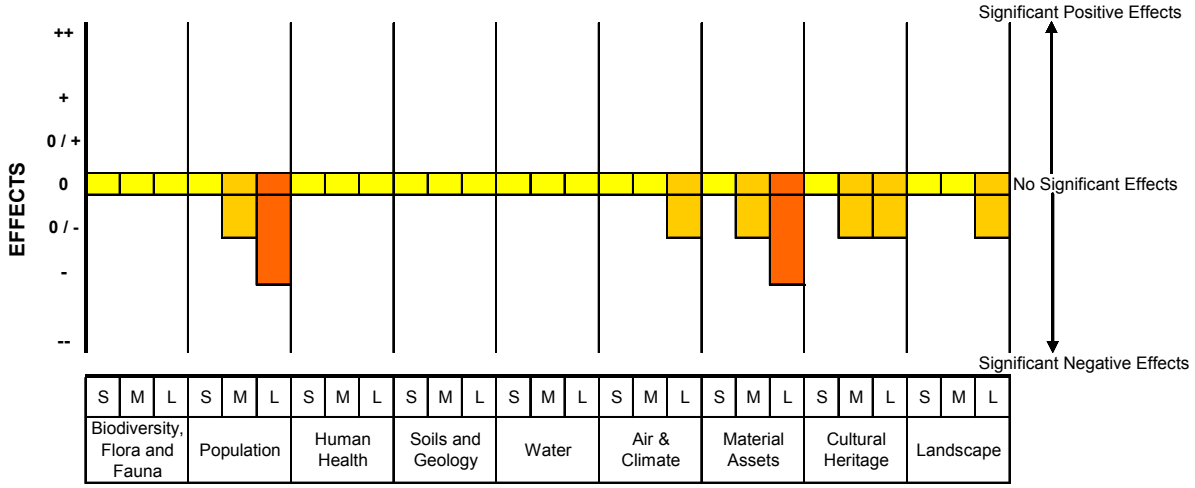
8.1.9 Landscape

In the short, medium and long term it is unlikely that there will be any significant positive or negative effects on Landscape in the study area due to non-implementation of Vision 2041. There is the possibility however that by not implementing Vision 2041 that the SFPC facilities are not maintained or updated, leading to them becoming more noticeable and being eyesores in the estuary landscape.

8.1.10 Alternative 1 Summary

A summary figure of the impacts, and their significance, of not implementing Vision 2041 is given below in **Figure 8.1**.

Figure 8.1: Assessment Alternative 1 – Do Nothing Option



8.1.11 Interrelationship of Effects

The main interrelationship of effects without the implementation of Vision 2041 would be between material assets and population, whereas the potential inability of the SFPC facilities to continue importing materials and to keep up with modern requirements will mean a lack of development in the region, losses of jobs and potential population shifts to other areas with more employment potential.

8.2 ALTERNATIVE 2 (BROADLY EQUATES TO STRATEGIC SITE D FROM SIFP) – UTILISATION OF EXISTING ASSETS

8.2.1 Biodiversity, Flora and Fauna

The utilisation of existing assets is unlikely to cause any significant changes to existing impacts on biodiversity, flora and fauna in the short, medium and long term. With no changes in the footprint of port facilities and with only minor changes to operational activities within this existing area, the impacts on the local and regional biodiversity, flora and fauna would most likely remain as they currently are.

8.2.2 Population

The utilisation of existing assets is unlikely to cause any significant changes to existing impacts on population in the short term. In the medium and long term of Vision 2041 the utilisation of existing facilities gives greater potential for the maintenance of existing employment and the generation of more employment opportunities, as SFPC is able to keep with future operational demands to some degree. This is likely to provide a slight positive impact to the local population.

8.2.3 Human Health

The utilisation of existing assets is unlikely to cause any significant changes to existing impacts on human health in the short, medium and long term. There is still likely to be the potential for nuisances associated with industrial activities, such as noise, odour or dust, however the potential for these impacts currently exists. It is likely that the potential for these nuisances should reduce over time with tighter environmental regulation; however this is not due to implementation of Vision 2041.

8.2.4 Soils and Geology

The utilisation of existing assets is unlikely to cause any significant changes to existing impacts on soils and geology in the study area in the short, medium and long term, as there will be no change in footprint of the SFPC facilities.

8.2.5 Water

The utilisation of existing assets is unlikely to cause any significant changes to existing impacts on water quality or quantity in the short, medium and long term. It is likely that the water quality in the study area will improve over time with tighter environmental regulation, such as the Water Framework Directive; however this is not due to implementation of Vision 2041.

8.2.6 Air and Climate

In the short, medium and long term it is unlikely that there will be any significant positive or negative effects on air quality in the study area due to utilisation of existing assets. This alternative is also

unlikely to have any impacts on climatic factors, however in the long term, if current climate change predictions are correct, the existing SFPC facilities may not be suitable for rising water levels, flash flooding and general disrupted weather patterns. This could lead to negative impacts for the port operations.

8.2.7 Material Assets

Through utilisation of existing assets there is unlikely to be any noticeable impacts on material assets in the study area in the short term, as SFPC facilities operate as normal. In the medium and long term the SFPC facilities may be able to adapt to some degree to changing operational requirements and new technologies, however as the facilities are spatially limited there will most likely be the loss of contracts to larger facilities with greater capacity, future restrictions on import tonnages at SFPC facilities and then potentially stunted development potential in the region. By only utilising existing assets there is therefore the potential for significant negative effects in the long term. There is still the potential for slight positive impacts however in the medium and long term as the SFPC facilities will have some degree of flexibility in how they utilise their existing assets.

8.2.8 Cultural Heritage, including Archaeological and Architectural Heritage

Through utilisation of existing assets there is unlikely to be many noticeable impacts on Cultural Heritage, including Archaeological and Architectural Heritage, in the study area in the short, medium and long term. However as the effective utilisation of existing assets does not include the restoration or re-use of Bannatyne Mills and Sailors House, there is the potential for these heritage features to fall completely into disrepair and be lost forever as heritage assets.

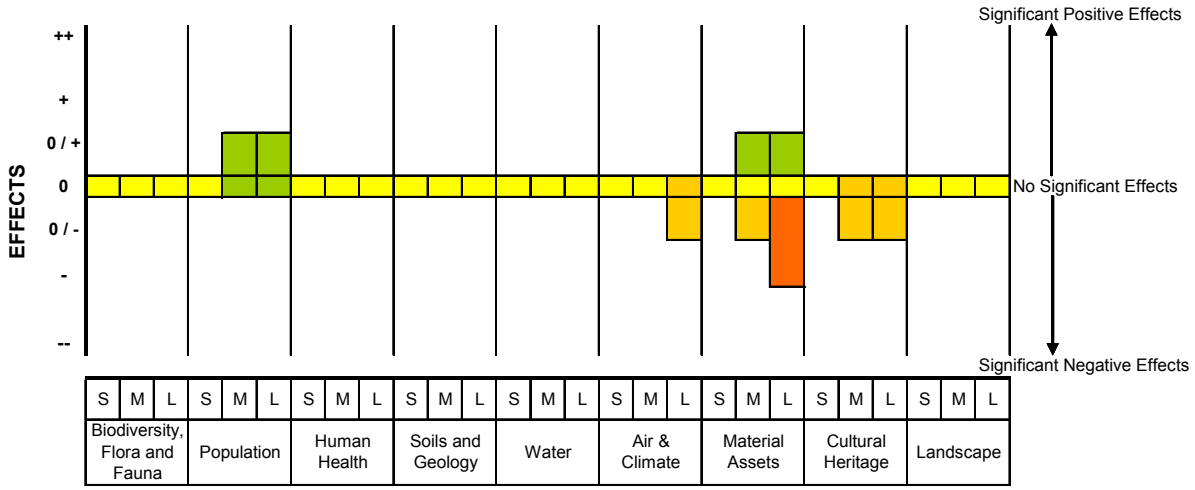
8.2.9 Landscape

Through utilisation of existing assets there is unlikely to be any significant changes to existing impacts on landscape in the short, medium and long term. The utilisation of existing assets will however maintain the existing facilities, which should therefore not degrade and become eyesores throughout the Vision 2041 timescale.

8.2.10 Alternative 2 (Broadly Equates to Strategic Site D from SIFP) Summary

A summary figure of the impacts, and their significance, of implementing Alternative 2 of Vision 2041, Effective Utilisation of Existing Assets at Port of Foynes and Limerick Docks is given below in **Figure 8.2**.

Figure 8.2: Assessment Alternative 2 – Utilisation of Existing Assets



8.2.11 Interrelationship of Effects

The main interrelationship of effects by effective utilisation of existing assets would be between material assets and population, whereas the potential of the SFPC facilities to continue to operate at some capacity into the medium and long term by continuing to import materials and to keep up with modern requirements will mean there may be some new employment created and some new development in the region. However conversely, as the SFPC facilities may lose out on larger contracts to other similar facilities, which have a greater available capacity, there will be the potential for significant negative impacts in the long term.

8.3 ALTERNATIVE 3 (BROADLY EQUATES TO STRATEGIC SITE D FROM SIFP) – PORT OF FOYNES ESTATE EXPANSION

8.3.1 Biodiversity, Flora and Fauna

As this site is located adjacent to an SAC and SPA this option has the potential to have both positive and negative direct and indirect effects on flora and fauna at the Foynes site. While the detail in relation to the scale and type of project which may be proposed for this site is unknown at present it is anticipated that any development may result in in-direct impacts through noise and disturbance to birds on the adjacent Robertstown River SPA, however this will depend on the scale and type of development as the options for this site. In most instances any future development at this site would represent a short to medium term impact through disturbance only, however in the medium to long term of Vision 2041. Overall, implementation of this option is likely to have a slight negative effect. To mitigate these potential impacts, an ecological assessment, particularly with regards to protected

species such as Otters and Bats, which have been identified as present within the site, should be carried out prior to the commencement of works. The design and construction of the works should maintain current habitat where possible and should also consider the creation of habitat suitable to the location and prevailing species. It should also incorporate specific measures in relation to the temporary disturbance to feeding birds along the Robertstown River.

8.3.2 Population

Long-term, direct and indirect positive effects on the surrounding population are likely to result from implementation of this option. The preferred option for development of this site would add to the current provision of jobs through Foynes Port and ancillary activities. It would help prevent de-population of the rural environment and assist families by cutting down the need to travel long distances to obtain work.

8.3.3 Human Health

As residential properties are not located directly beside the site, direct and in-direct negative effects of construction and operation are thought to be low in terms of impacts to human health from any form of development, and therefore no mitigation would be required. Health impacts through nuisance are likely to be short term during construction of facilities and can be mitigated for with good site practice and project planning.

8.3.4 Soils and Geology

The landuse within this area is primarily agriculture with little soil erosion due to the presence of the embankments along the eastern portion of the site. As any development of this site will not lead to the removal or undermining of these embankments there is minimal risk of soil erosion. Development on previous greenfield sites would however effectively remove the soil as a resource and growing medium. The maintenance of green spaces within the development area, and the re-use of the excavated material could offset some of this loss.

8.3.5 Water

This option is likely to have both positive and negative direct and indirect effects on the WFD status of the water body within which the proposed works are located as well as indirect effects on the WFD status of downstream water bodies. Depending on the scale and size of the works, sewage treatment facilities may also be required or connection to a WWTP. The reduced risk of contamination of water from polluting sources within this site which could have a positive effect on WFD status. However, water quality could be negatively affected during the works stage though this would be a temporary impact. Once completed, it is likely that the type of development being suggested for this site would represent a hydromorphological pressure on the river and the resulting changes to the river regime are likely to lead to further negative effects such as increased suspended solid levels, erosion and deposition which would all have a negative impact on WFD status. Maintenance works could also temporarily negatively affect WFD status. Overall, implementation of this option is likely to have a

slight negative effect as has the potential to fail to meet the minimum target of this objective. To mitigate potential impacts the design of any facilities and maintenance regime should aim to limit the impacts associated with this option and should consider the achievement of WFD objectives outlined in the Shannon River Basin Management Plan. This could include carrying out works during specified periods and using environmentally sensitive techniques. It could also involve improvement works where possible to the existing jetty rather than creating new structures. In-situ continuous water quality monitoring can be used on site during the construction process to ensure impact to water quality is kept to a minimum which will also assist in protecting fisheries and cetaceans in the area.

8.3.6 Air and Climate

As the option will not involve the construction of any industrial facility or any facility which would impact on the air quality the implementation of this option is likely to have a neutral effect on air quality and no mitigation is required. The construction period of the development may provide some increases in emissions to air from construction plant; however these are likely to be temporary and relatively insignificant.

Provided the development of the SFPC facilities to the south east of Foynes take into account the predicted changes in climatic conditions in facility design, and that the sourcing of materials is done locally with minimal carbon footprint, there should be no significant impacts on climatic factors.

8.3.7 Material Assets

By expanding SFPC facilities to the south east of Foynes there will be both direct and in-direct significant increases in new material assets in the area in the medium and long term. The development of new facilities at Foynes is likely to encourage the secondary development of other new facilities and assets and the updating of existing assets within the area. This will therefore provide significant positive impacts with regards to material assets.

8.3.8 Cultural Heritage, including Archaeological and Architectural Heritage

The implementation of this option is likely to have a direct, positive and permanent effects on cultural heritage within the site. Features of archaeological interest such as the salmon weirs, shipwreck, fulacht fia and battery which are located within the site boundary can be adequately assessed for potential impacts in accordance with DAHG guidelines. There is the potential for heritage features to be restored and new features to be discovered through the implementation of this option provided development works in likely find areas are monitored by a qualified heritage expert. There is however the potential for direct permanent negative impacts if the development of the area is not adequately screened for heritage features prior to construction, which may lead to the permanent loss of some heritage features.

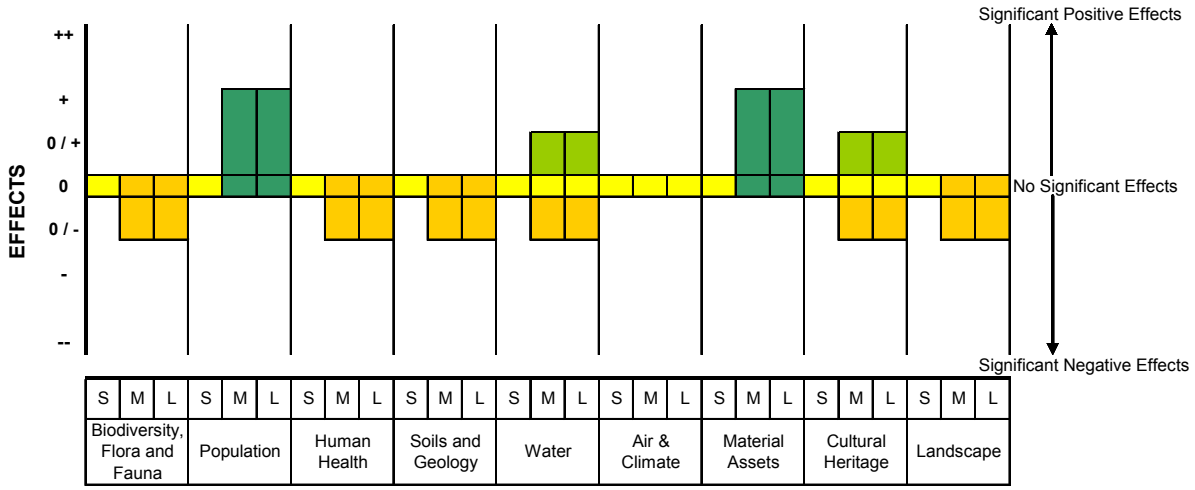
8.3.9 Landscape

The implementation of this option is likely to have a direct and permanent negative effect on visual amenity and local landscape character. Any development requiring construction has the potential to be visually intrusive, altering views of the river. Views from the Shannon estuary looking inward will also be altered having a slight negative effect, failing to meet the minimum targets of this objective. To mitigate these impacts any construction works should be screened and any permanent infrastructure should be designed sympathetically to blend with the landscape as best possible.

8.3.10 Alternative 3 (Broadly Equates to Strategic Site D from SIFP) Summary

A summary figure of the impacts, and their significance, of implementing Alternative 3 of Vision 2041, Port of Foynes Estate Expansion is given below in **Figure 8.3**.

Figure 8.3: Assessment Alternative 3 – Port of Foynes Estate Expansion



8.3.11 Interrelationship of Effects

The main interrelationship of effects by expanding the Port of Foynes estate to the south east would be the positive relationship between material assets and population, whereas the development of new SFPC facilities into the medium and long term will create new employment in the region and encourage secondary indirect development. The expansion of the SFPC facilities onto greenfield sites, with a new development footprint, will cause the loss of soil as a growing medium and therefore will reduce biodiversity, flora and fauna in the study area.

8.4 ALTERNATIVE 4 (BROADLY EQUATES TO STRATEGIC SITE E FROM SIFP) – PORT OF FOYNES REMOTE OPERATIONS

8.4.1 Biodiversity, Flora and Fauna

This site is located only partially within the SAC and SPA boundary to the north western corner of the site therefore the overall potential for impact on qualifying interest features of the Natura 2000 sites together with other important features is very low. According to the Appropriate Assessment only very small or minor portions of the Qualifying Interest features of the SAC and SPA may be affected by future development at this site. This does not negate the consideration for in-direct impacts at project level once a proposal is brought forward. Development on greenfield sites will cause direct and permanent negative impacts on biodiversity, flora and fauna. It would be recommended to incorporate green spaces and to retain hedgerows and wildlife corridors where possible during the development to help partially mitigate for losses to biodiversity, flora and fauna within the area.

8.4.2 Population

Long-term, direct and indirect positive effects on the surrounding population are likely to result from implementation of this option. The preferred option for development of this site could potential provide future employment opportunities either directly or through ancillary activities. It would help prevent de-population of the rural environment and assist families by cutting down the need to travel long distances to obtain work.

8.4.3 Human Health

Potential for direct and in-direct negative effects of construction and operation would be low in terms of impacts to human health from any form of development. Health impacts through nuisance are likely to be short term during the construction of facilities and can be mitigated for with good site practice and project planning.

8.4.4 Soils and Geology

This site is set in a primarily agricultural landuse area, however is zoned for industrial and employment uses. Development on greenfield sites would however effectively remove the soil as a resource and growing medium. The maintenance of green spaces within the development area, and the re-use of the excavated material could offset some of this loss.

8.4.5 Water

Should development at this site require an industrial discharge, compliance with the Urban Waste Water Regulations, the Shannon International River Basin Management Plan and EU requirements, will be required and will take account of the drainage system and the quality and quantity of receiving waters in the area when assessing development proposals. Proposals will be required to comply with

the development management standards set out in the Limerick County Development Plans. Site development should (where possible) seek the implementation of rainwater harvesting, SuDS and best practice guidance for the collection and reuse or disposal and treatment of surface water from proposed land based developments. Such systems will be required to conserve water, protect water quality and regulate the rate of surface water runoff so as not to cause or exacerbate flooding on the relevant site or elsewhere.

This option is likely to have both positive and negative direct and indirect effects on the WFD status of the water body within which the proposed works are located as well as indirect effects on the WFD status of downstream water bodies. Depending on the scale and size of the works sewage treatment facilities may also be required or connection to a WWTP. The reduced risk of contamination of water from polluting sources within this site which could have a positive effect on WFD status.

8.4.6 Air and Climate

Air emissions can also have impacts on flora and fauna. The EU Council Directive 1999/30/EC outlines ambient air quality limits for the protection of human health and other sensitive areas for a range of air pollutants. Should future development require emissions to air which are considered hazardous a licence may be required from the EPA or Local Authority to ensure it is within acceptable levels. For pollutants that may have an impact on the local ecology, specific limits may be required. Air quality is a major concern both at the local community level and on a broader national/global scale. Air quality should be maintained within World Health Organisation guidelines and IPC licence limits. As it is unlikely that any development at this site in conjunction with SFPC will not require emissions to air it is unlikely to have potential direct effects over the long term. However as the Askeaton operations are remote from the Port of Foynes there is likely to be the increase in laden and un-laden Heavy Goods Vehicles commuting between the two sites. There is therefore the potential for an increase in exhaust emissions along the N69 and thus a slight negative impact. Effective traffic planning, cleaner transport technologies or implementation of a rail-link may help mitigate for these increased emissions.

8.4.7 Material Assets

This site is identified in the MWRG, drafts MWASP, Limerick County Development Plan as a Strategic Site, occupying a strategic location alongside the N69 within close proximity to both Limerick City and the Port of Foynes. Development at this site may be dependant in part on upgrades to the existing N69.

A new waste water treatment facility has been proposed as part of the Askeaton Sewerage Scheme (Formerly Athea Askeaton Foynes Shanagolden Glin grouped sewerage scheme). The Askeaton Sewerage Scheme is included in the 2010-2012 Water Services Investment Programme by the Department of Environment, Heritage and Local Government. Currently the sewerage facilities in the town are inadequate and as part of the scheme the towns are to be provided with wastewater facilities to serve their existing and future requirements. The overall scheme will cater for a future population

loading of 11,000PE in 2032. The development of this site will need to consider the capacity of this plant to ensure it does not compromise the facilities operation. Through the promotion and upgrade to existing material assets associated with or adjacent to this site it will therefore provide significant positive impacts with regards to material assets.

This site is set in a primarily agricultural landuse area with dairy cattle and other animals reputed to be sensitive to sudden noise events that may occur as part of any construction. Any sensitive agricultural enterprise would have to be facilitated through consultation with landowners to allow movement of animals prior to noise events. The impacts on livestock are thought to be low and can mitigated for at project level.

The development of new SFPC facilities at Askeaton is a direct positive impact on material assets and is likely to encourage further indirect positive impacts on material assets through the secondary development of other new facilities and assets and the updating of existing assets within the area. This will therefore provide significant positive impacts with regards to material assets.

8.4.8 Cultural Heritage, including Archaeological and Architectural Heritage

The implementation of this option is likely to have a direct, positive and permanent effects on cultural heritage within the site. Features of archaeological interest such as the ringfort which is located within the site boundary can be adequately assessed for potential impacts in accordance with DAHG guidelines. There is the potential for heritage features to be restored and new features to be discovered through the implementation of this option provided development works find areas are monitored by a qualified heritage expert. There is however the potential for direct permanent negative impacts if the development of the area is not adequately screened for heritage features prior to construction, which may lead to the permanent loss of some heritage features.

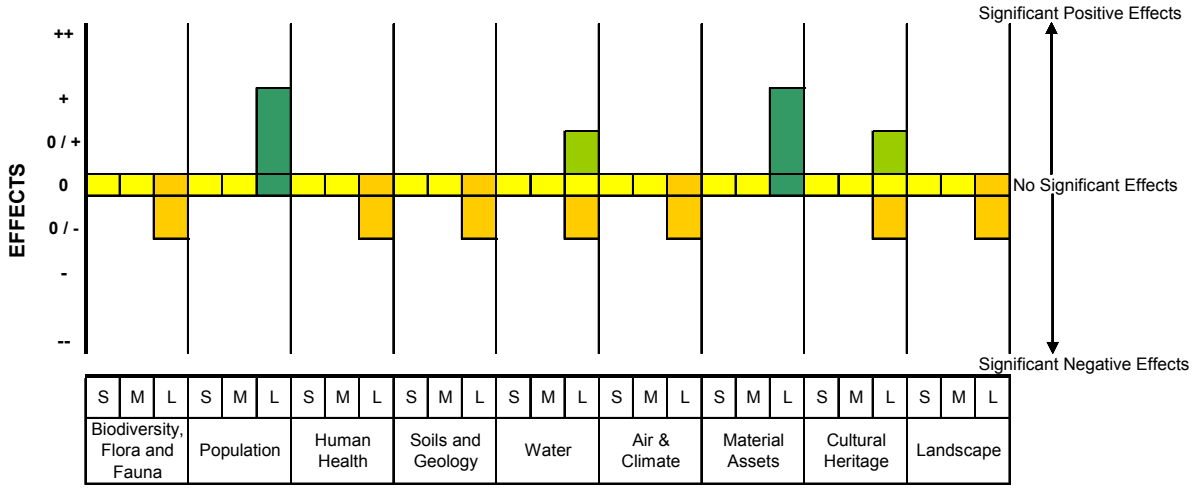
8.4.9 Landscape

The vast majority of these lands are within the ownership of Shannon Development, and in conjunction with Limerick County Council, these lands have been identified as a strategic zoning in the County Development Plan for Limerick for industry and employment. Objective ED 04 safeguards these lands for the establishment of industry and enterprise of regional importance. Both IDA Ireland and Shannon Development are actively promoting and marketing the business park at Askeaton to potential investors and are working closely to develop a common approach to planning at the park. The site is located outside the development limits of Askeaton, alongside the N69 Transport corridor. The land is relatively flat agricultural land, adjacent to a number of small residential dwellings and the village of Askeaton. Visual impacts will need to be taken into consideration in particular from the village of Askeaton and for the local community there is therefore the potential for some negative impacts.

8.4.10 Alternative 4 (Broadly Equates to Strategic Site E from SIFP) Summary

A summary figure of the impacts, and their significance, of implementing Alternative 4 of Vision 2041, Port of Foynes Remote Operations at Askeaton Business Park is given below in **Figure 8.4**.

Figure 8.4: Assessment Alternative 4 – Port of Foynes Remote Operations



8.4.11 Interrelationship of Effects

The main interrelationship of effects by developing the Port of Foynes Remote Operations expanding would be the positive relationship between material assets and population, whereas the development of new SFPC facilities in the long term will create new employment in the region and encourage secondary indirect development. The expansion of the SFPC facilities onto greenfield sites, with a new development footprint, will cause the loss of soil as a growing medium and therefore will reduce biodiversity, flora and fauna in the study area.

8.5 ALTERNATIVE 5 – ADDITIONAL BERTHING FACILITIES AT FOYNES

8.5.1 Biodiversity, Flora and Fauna

Potential for significant negative effects in the medium and long term due to direct disruption to the designated features within the adjacent SAC, pSPA and NHA. This site is located within the direct footprint of the SAC and pSPA with the potential for permanent loss of habitat. However, this will be dependent on the scale and type of development. Dependant on the structure and function of the habitat within this area together with the careful design of mitigation measures these long term effects can be reduced.

8.5.2 Population

Long-term, direct and indirect positive effects on the surrounding population are likely to result from implementation of this option. The preferred option for development of this site would add to the current provision of jobs through the acceptance of vessels with greater tonnage. This together with associated ancillary activities would help prevent de-population of the rural environment and assist families by cutting down the need to travel long distances to obtain work.

8.5.3 Human Health

Increased emissions and noise from additional berthing ships, additional port traffic and additional ancillary equipment have the potential for negative impacts on human health. Also, if there is an increase in fine grained cargos received there is a greater potential for nuisance dust. It is however unlikely that the creation of additional berthing facilities at Foynes will cause significant impacts on human health as the local receptors are not in close proximity to the berthing areas. Good site practices and strict working guidelines (eg. traffic planning, vehicle idling regulation, working hours) should prevent these increased activities from effecting human health in the study area.

8.5.4 Soils and Geology

This option to provide additional berthing facilities at Foynes would have direct, negative and permanent effects on the substrate at the site, should this development of new infrastructure require dredging. This may result in the permanent loss of materials at Foynes which can alter the natural erosional and depositional processes of the estuarine habitat.

8.5.5 Water

This option may have negative direct and indirect effects on the WFD status of the water body within which the proposed works are located as well as indirect effects on the WFD status of downstream water bodies. Depending on the scale and size of the vessels which are brought in to these additional berths pollution through discharges, loss of oil, diesel and potential for pollution incidents are greater with larger vessels. However, negative water quality impacts during the construction stage should only be temporary impacts. Maintenance works could also have short term negative impacts on the WFD status in the long term of Vision 2041. Overall, implementation of this option is likely to have a slight negative impact. To mitigate potential impacts, the design of any facilities and maintenance regime should aim to limit the impacts associated with this option and should consider the achievement of WFD objectives outlined in the Shannon River Basin Management Plan. This could include carrying out works during specified periods and using environmentally sensitive techniques. Good site practice and site environmental management may be able to mitigate for many of the potential water quality impacts associated with this option.

8.5.6 Air and Climate

The potential for medium to long terms impacts will increase with the potential for air emissions associated with the likely greater numbers of vessels berthing and the larger size of these vessels. In

additions the potential for medium to long term impacts from vehicles accessing the port will increase emissions to air in the locality which could also be viewed as long term as it will be on-going.

Increased emissions from additional berthing ships, additional port traffic and additional ancillary equipment have the potential for negative impacts on air quality. Also, if there is an increase in fine grained cargos received there is a greater potential for nuisance dust. It is however unlikely that the creation of additional berthing facilities at Foynes will cause significant impacts on air quality at the local receptors as they are not in close proximity to the berthing areas and the proportionate increase in vessels is unlikely to be significant, given the space restrictions for development in the area. Good site practices and strict working guidelines (eg. traffic planning, vehicle idling regulation, working hours) should prevent these increased activities from significantly effecting air quality in the study area.

Increased greenhouse gas emissions (GHG) from vessels, port vehicles and ancillary equipment could also potentially have slight negative impacts on climate and climatic change; however this increase in emissions is not likely to be significant. The use of renewable energy and alternative fuel vehicles may help mitigate for potential GHG emissions. Provided the potential new berthing facilities are designed with potential climatic change factors taken into account, there should be no further impacts on or from climate.

8.5.7 Material Assets

This option to provide additional berthing facilities at Foynes will have a direct positive medium to long term impact with the direct increase in material assets through the creation of new berthing facilities at Foynes. In addition to this there the indirect positive impacts with the increased ability of the Port to accept greater tonnages. As an in-direct medium to long term impact the potential for associated road and rail upgrades would be required as part of this option. There is also a greater potential for indirect secondary development to occur following the implementation of this option.

8.5.8 Cultural Heritage, including Archaeological and Architectural Heritage

It is unlikely that there will any significant impacts on Cultural Heritage, including Archaeological and Architectural Heritage provided adequate archaeological investigations take place prior to any dredging and development as per DAHG guidelines. The database created as part of the SIFP process should be interrogated for the location of shipwrecks or other features of cultural or archaeological interest prior to any future development.

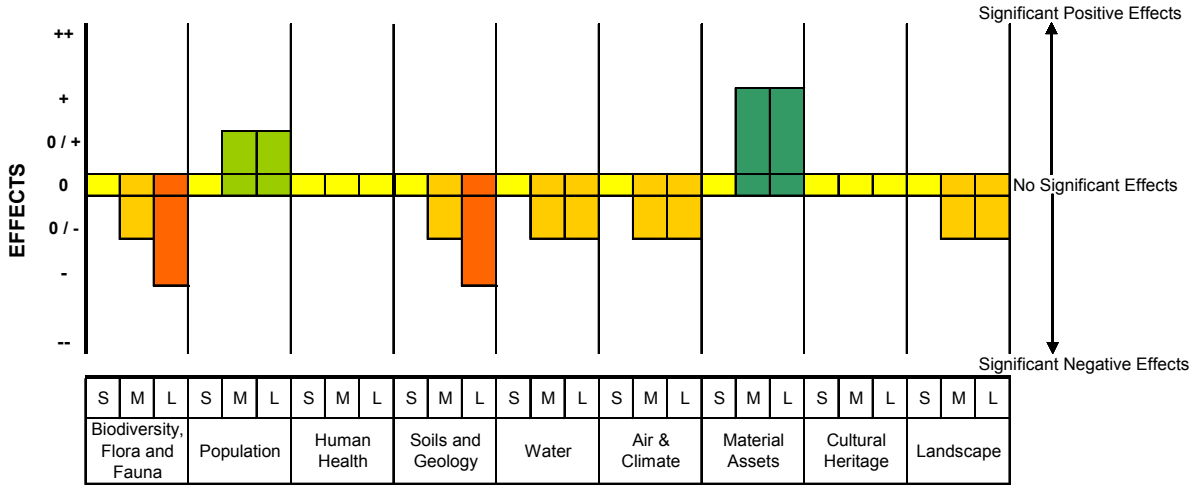
8.5.9 Landscape

The implementation of this alternative is likely to have the potential for negative impacts on the landscape as greater numbers of vessels are moored off Foynes, or berthing at the Port. Any additional structures at the port should not be visually intrusive and should not alter views of the river as it will largely blend with the surrounding existing port infrastructure.

8.5.10 Alternative 5 Summary

A summary figure of the impacts, and their significance, of implementing Alternative 5 of Vision 2041, Additional Berthing Facilities at the Port of Foynes is given below in **Figure 8.5**.

Figure 8.5: Assessment Alternative 5 – Additional Berthing Facilities at the Port of Foynes



8.5.11 Interrelationship of Effects

The main interrelationship of effects of adding additional berthing facilities at the Port of Foynes would be the positive relationship between material assets and population, whereas the development of new SFPC facilities into the medium and long term will create new employment in the region and encourage secondary indirect development. The medium and long term impacts on soil, geology and biodiversity, flora and fauna would need to be carefully considered.

8.6 ALTERNATIVE 6 (BROADLY EQUATES TO STRATEGIC SITE C FROM SIFP) DEEP WATER BERTHAGE FOYNES ISLAND

8.6.1 Biodiversity, Flora and Fauna

The proposed deep water berthage site at Foynes Island is located directly within a cSAC and pSPA. This option has the potential to have both positive and negative direct and indirect effects on flora and fauna at the Foynes Island site. While the detail in relation to the scale and type of project which may be proposed for this site is unknown at present it is anticipated that any development may result in, indirect impacts through noise and disturbance to the resident group of Bottlenose Dolphins in the Estuary who frequently use this site. While this site is not located within “critical habitat” as per the

detailed conservation objectives (NPWS, 2012) for the Shannon Estuary it does border or provides access to suitable habitat therefore the species range within the site should not be restricted by artificial barriers to site use. In-direct impacts to birds will depend on the scale and type of development as the options for this site are primarily associated with marine related industry. Aerial infrastructure which could impact on flight paths is not envisaged. In most instances any future development at this site would represent a short to medium term impact through disturbance only.

In addition, any required dredging works (both capital and maintenance) are likely to negatively affect flora and fauna in the short-term. Overall, implementation of this option is likely to have slight negative permanent impacts on biodiversity, flora and fauna in the medium and long term.

8.6.2 Population

Long-term, direct and indirect positive effects on the surrounding population are likely to result from implementation of this option. The preferred option for development of this site would add to the current provision of jobs through Foynes Port and ancillary activities. It would decrease de-population of the rural environment assist families by cutting down the need to travel long distances to obtain work which has knock on effects in terms of human health.

8.6.3 Human Health

Increased emissions and noise from additional berthing ships, larger vessels, additional port traffic and additional ancillary equipment have the potential for negative impacts on human health. Also, if there is an increase in fine grained cargos received there is a greater potential for nuisance dust. It is however unlikely that the creation of deep water berthing facilities at Foynes Island will cause significant impacts on human health as the local receptors are not in close proximity to the proposed berthing area. Good site practices and strict working guidelines (eg. traffic planning, vehicle idling regulation, working hours) should prevent these larger vessels and increased activities from effecting human health in the study area.

The potentially significant provision of employment in the area would decrease de-population of the rural environment and assist families by cutting down the need to travel long distances to obtain work, which has knock on effects in terms of human health. Physical and emotional stress associated with trying to find work and having to travel considerable distances into Limerick City along the congested N69 for work would be decreased if jobs could be created locally. As residential properties are not located near to the proposed site direct and in-direct effects are thought to be low in terms of impacts to human health from any form of development at this site.

8.6.4 Soils and Geology

This option to develop deep water berthage at Foynes Island is likely to have direct, permanent, positive and negative effects on soils and geology in the area. The option is likely to help prevent soil erosion on the island, which can be subject to intermittent tidal erosion. Should new infrastructure

require reinforcement, embankment or engineering works to stabilise the coastline it should assist in dramatically reducing the risk of erosion. However, any future hardstanding areas associated with the development and any dredging requirements are likely to cause the permanent loss of soil resource, which would be a negative impact.

8.6.5 Water

This alternative is likely to have both positive and negative direct and indirect effects on the WFD status of the water body within which the proposed works are located as well as indirect effects on the WFD status of downstream water bodies. Depending on the scale and size of the works sewage treatment facilities may also be required or connection to a WWTP. The reduced risk of contamination of water from polluting sources within this site could have a positive effect on WFD status, water quality could be negatively affected during the works stage though this would be a temporary impact. Once completed, it is likely that the type of development being suggested for this site would represent a hydromorphological pressure on the river and the resulting changes to the river regime are likely to lead to further negative effects such as increased suspended solid levels, erosion and deposition which would all have a negative impact on WFD status. Maintenance works could also negatively affect WFD status in the short-term. Overall, implementation of this option is likely to have a slight negative effect as it would fail to meet the minimum target of this objective.

8.6.6 Air and Climate

There are currently no issues with regards to air quality and emissions at this site. It is unlikely that the proposed option for this site will involve the construction of an industrial facility or any facility which would impact on air quality. Should future development require emissions to air which are considered hazardous, a licence may be required from the EPA or Local Authority to ensure it is within acceptable levels. The potential for medium to long terms impacts will increase with the potential for air emissions associated with the potential for greater numbers of vessels berthing and larger size vessels docking. In additions the potential for short to medium term impacts from vehicles accessing this new port area will increase emissions to air in the locality which could also be viewed as long term as it will be on-going.

Provided the development of deep water berthage at Foynes Island is designed with climate change predictions in mind it should not be negatively impacted up by future climatic factors. The proposed development should not significantly contribute to climate change through green house gas emissions.

8.6.7 Material Assets

Depending on future proposals for this site it may or may not require an access route through the island. For example a transhipment proposal which would only require docking/harbour facilities may not require access through the island. As proposals are brought forward for this location which may require access through the island, viable options for access routes should be assessed as part of an alternative options reports for this location and in consultation with the islanders. There is a disused oil

terminal consisting of a large pier and platforms on the north side of Island which could be upgraded to be used commercially. However, this would require a substantial upgrade. This will have a direct positive medium to long term impact with the direct increase in material assets through the creation of new berthing facilities at Foynes Island. In addition the increased ability of the Port to accept greater tonnages will provide a positive effect. As an in-direct medium to long term impact the potential for associated road and rail upgrades would be required as part of this option and there is a greater potential for indirect secondary development to occur.

8.6.8 Cultural Heritage, including Archaeological and Architectural Heritage

The implementation of this option is likely to have a direct, positive and permanent effect or neutral effect on cultural heritage within the site. Features of archaeological interest such as the salmon weirs, shipwreck, fulacht fia and battery which are located within the site boundary as documented through the SIFP process can be adequately assessed for potential impacts in accordance with DAHG guidelines. This could be a major positive effect and this option would achieve the aspirational target for this objective, however would require the implementation of mitigation measures to ensure the heritage features are retained and not lost during construction.

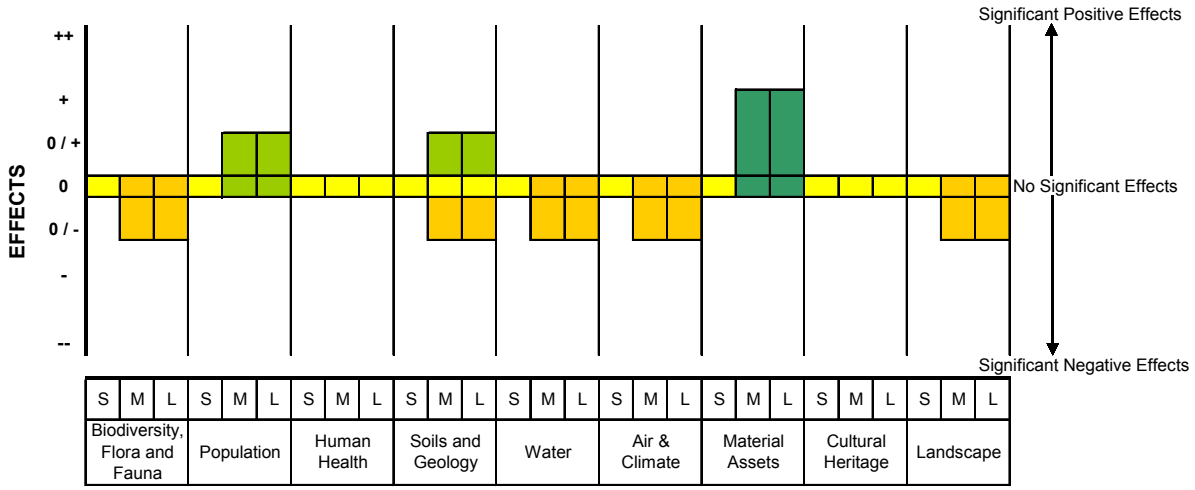
8.6.9 Landscape

The implementation of this option is likely to have minimal negative effect on visual amenity and local landscape character. Any development requiring construction is likely to be visually unobtrusive and should not alter views of the river. The potential impact on the landscape character could be minimised by developing on the low lying areas of the island away from the steeper slopes which would be more visible from both upstream and downstream. The site does not impact on significant trees or woodlands. By also building on existing infrastructure it will minimise visual impacts. Views from the Shannon estuary looking inward should not be altered therefore meeting minimum targets of this objective. An increased number of larger vessels may however provide temporary slight negative impacts on the local natural estuary landscape in the medium and long term.

8.6.10 Alternative 6 (Broadly Equates to Strategic Site C from SIFP) Summary

A summary figure of the impacts, and their significance, of implementing Alternative 6 of Vision 2041, Deep Water Berthage at Foynes Island is given below in **Figure 8.6**.

Figure 8.6: Assessment Alternative 6 – Deep Water Berthage at Foynes Island



8.6.11 Interrelationship of Effects

The main interrelationship of effects of adding Deep Water Berthage at Foynes Island would be the positive relationship between material assets and population, whereas the development of new SFPC facilities into the medium and long term will create new employment in the region and encourage secondary indirect development. The medium and long term negative impacts on water, air and climate, biodiversity and flora and fauna together with landscape are all interrelated.

8.7 ALTERNATIVE 7A – CORCANREE BUSINESS PARK

8.7.1 Biodiversity, Flora and Fauna

The Corcanree Business Park is not known to contain any features of significant ecological interest; however the site is located adjacent to the Lower River Shannon SAC (IE0002165), the River Shannon and Fergus Estuaries SPA (004077), the Inner Shannon Estuary – South Shore pNHA (000435) and the Fergus Estuary and Inner Shannon – North Shore pNHA (002048). The site also contains a small portion of mudflats nearest the western portion of site only (Deel River Estuary to Ballynaclough River Estuary). There is the potential for negative impacts on biodiversity, flora and fauna from the construction activities during the development of this site; however these can be kept to a minimum with environmentally sensitive working practices that provide no disturbance to the designated features of the adjacent sites. However, due to the loss of a greenfield site there will be slight negative permanent impacts to biodiversity, flora and fauna.

8.7.2 Population

Long-term, direct and indirect positive effects on the surrounding population of Limerick City are likely to result from implementation of this option. The preferred option for development of this site has the potential to provide further job opportunities within the city environs.

8.7.3 Human Health

As some residential and commercial properties are located adjacent to the site, direct and in-direct effects of any future development, expansion or material alteration of use of the site would need to be assessed in terms of impacts to human health. The existing uses at the site and their compatibility with alternative uses and the potential for a health and safety risk would also need to be considered. It is unlikely that development of SFPC facilities at Corcanree Business Park would have any significant impacts on human health in the short, medium and long term of Vision 2041 provided all standard health and safety guidelines are adhered to in construction and operation of the SFPC facilities.

8.7.4 Soils and Geology

This area for development of SFPC facilities is primarily agricultural lands adjacent to a number of business parks. The periphery of the site is surrounded by embankments. These important flood embankments will need to be maintained along the site boundary to protect the site from soil erosion and flooding. The sediment regime within this site would require modelling prior to development to ensure no loss of mudflats through alteration of the flow regime at this site. Slight negative impacts on soils may result due to permanent loss of soil material as a resource.

8.7.5 Water

Any future development of SFPC facilities at Corcanree Business Park will need to assess the impacts to water quality and how it will affect the WFD Status and objectives together with the requirements arising from the Marine Strategy Framework Directive. The extent of estuarine communities within the area of potential will need to be determined. The site is located upstream of Limerick City Council WWTP, any future development or discharges at this site should not impact on the assimilative capacity of the receiving water. The ambient river water quality results from the Limerick Main drainage scheme which discharges downstream of this site can be viewed and downloaded monthly from http://www.limerickcity.ie/Water/LimerickMainDrainage/. It is unlikely that future SFPC developments at this site will have significant negative impacts on water quality or quantity in the medium to long term, provided environmentally sensitive and sustainable design measures and good site working practices are implemented in the planning and construction of the SFPC facilities at this site. Examples of this would be to ensure that all wastewater and surface water is adequately collected and treated prior to leaving the site, rather than directly discharging to the adjacent waterbody.

8.7.6 Air and Climate

Development of SFPC facilities at Corcanree Business Park is unlikely to give rise to significant impacts on air quality and climatic factors in the short, medium and long term. As with any construction activities there is the risk of negative impacts from air emissions due to increased HGV traffic and construction plant; however these are temporary impacts that can be effectively mitigated for with good site management, planning and good working practices. There is currently no information on the likely SFPC activities that are planned for the site; however it is not thought that

they would include any large scale combustion, hazardous gaseous emissions, or significant greenhouse gas emissions.

Due to the low lying location of the site beside the River Shannon it is important that any SFPC development at Corcanree Business Park is adequately designed and protected by defences that have taken predicted climate change impacts into consideration.

8.7.7 Material Assets

While the Limerick Dock is in close proximity to the proposed development site, additional infrastructure will be required to connect/link marine related industry into the main Limerick Dock area depending on proposals which are brought forward for this alternative. Direct access through the adjacent wishbone alternative site is possible with relatively direct connections on to the existing N69 and further links to the Limerick Tunnel and motorway system.This will have direct positive impacts in the medium to long term with the direct increase in material assets through the creation of road and port related linkages. In addition there is a greater potential for indirect secondary development to occur. Overall there is the potential for significant positive impacts through the creation of new facilities at the site and the potential for indirect secondary development to occur.

8.7.8 Cultural Heritage, including Archaeological and Architectural Heritage

Development of SFPC facilities at Corcanree Business Park is unlikely to give rise to significant impacts on cultural, archaeological and / or architectural heritage features. No known heritage features have been identified at the site, however there is the potential that the development at the site, particularly given its riverside location, could unearth previously undiscovered features. Archaeological monitoring of the site development would be recommended and could lead to heritage finds.

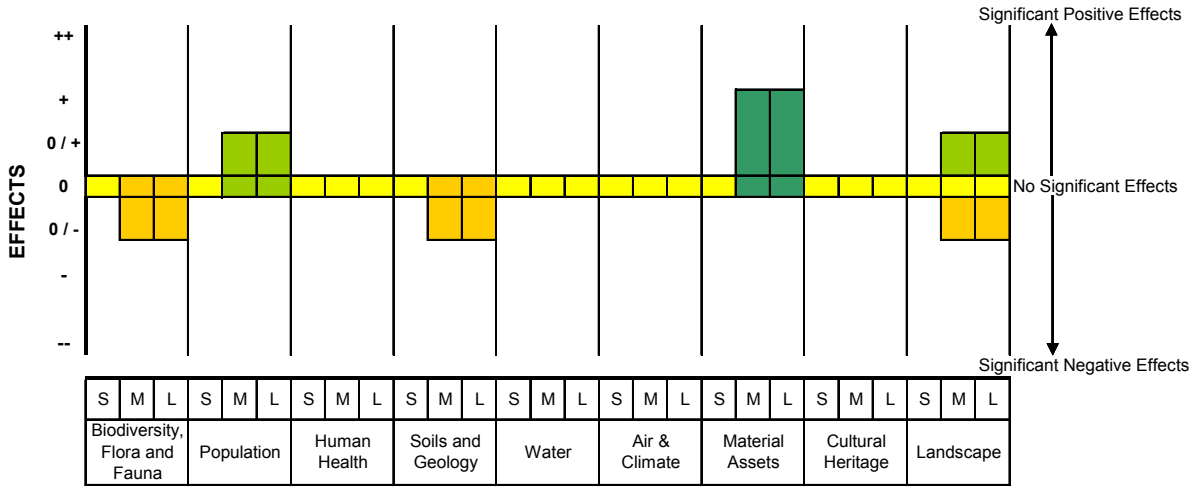
8.7.9 Landscape

Development of SFPC facilities at Corcanree Business Park has the potential for slight negative impacts on landscape through the loss of a greenfield site that is adjacent to the River Shannon. However there is also the potential for slight positive impact on the local landscape if the development is done sympathetically, blending with the landscape and river setting.

8.7.10 Alternative 7a Summary

A summary figure of the impacts, and their significance, of implementing Alternative 7a of Vision 2041, development at Limerick Docks Corcanree Business Park is given below in **Figure 8.7**.

Figure 8.7: Assessment Alternative 7a – Limerick Docks Corcanree Business Park



8.7.11 Interrelationship of Effects

The main interrelationship of effects of developing Limerick Docks Corcanree Business Park would be the positive relationship between material assets and population, whereas the development of new SFPC facilities into the medium and long term will create new employment in the region and encourage secondary indirect development. The medium and long term negative impacts on landscape, soils and geology together with flora and fauna are also inter-related but not envisaged to be significantly negative.

8.8 ALTERNATIVE 7B – THE WISHBONE

8.8.1 Biodiversity, Flora and Fauna

The Wishbone Site is not known to contain any features of significant ecological interest; however the site is located adjacent to the Lower River Shannon SAC (IE0002165), the River Shannon and Fergus Estuaries SPA (004077), the Inner Shannon Estuary – South Shore pNHA (000435) and the Fergus Estuary and Inner Shannon – North Shore pNHA (002048). There is the potential for negative impacts on biodiversity, flora and fauna from the construction activities during the development of this site; however these can be kept to a minimum with environmentally sensitive working practices that provide no disturbance to the designated features of the adjacent sites. However, due to the loss of a greenfield site there will be slight negative permanent impacts to biodiversity, flora and fauna.

8.8.2 Population

Long-term, direct and indirect positive effects on the surrounding population of Limerick City are likely to result from implementation of this option. The alternative for development of this site has the potential to provide further job opportunities within the city environs. Mixed use zoning would allow for general office use, education, commercial leisure, health services and so on as indicated in the draft

Vision 2041 plan. The existing uses at the site and their compatibility with alternative uses and the potential for a health and safety risk would also need to be considered.

8.8.3 Human Health

There are unlikely to be any significant impacts on human health from the development or zoning of the Wishbone site for use under mixed development as outlined in the draft Vision 2041 plan. It is unlikely that development of SFPC facilities would have any significant impacts on human health in the short, medium and long term of Vision 2041 provided all standard health and safety guidelines are adhered to during construction and operation. Therefore the potential impact of developing SFPC facilities at the Wishbone is effect is considered to be neutral in the short, medium and long term.

8.8.4 Soils and Geology

The landuse within this area is primarily agriculture with little soil erosion due to the presence of the embankments along the waterside portion of the alternative site. As any development of this site will not lead to the removal or undermining of these embankments there is minimal risk of soil erosion. Development on previous greenfield sites would however effectively remove the soil as a resource and growing medium. The maintenance of green spaces within the development area, and the re-use of the excavated material could offset some of this loss. There will therefore be a slight negative impact on soils and geology due to permanent loss of soil material as a resource.

8.8.5 Water

Any future development within this area of opportunity will need to assess the impacts to water quality and how it will affect the WFD Status and objectives together with the requirements arising from the Marine Strategy Framework Directive on the adjacent waterbody. It is unlikely that future developments at this alternative site will have significant medium to long term impacts on water quality or quantity. However due to the riverside location of the site it is imperative that construction is done to the appropriate standards and is well planned to ensure there is no deterioration of the adjacent waterbody.

8.8.6 Air and Climate

Development of SFPC facilities at the Wishbone site is unlikely to give rise to significant impacts on air quality and climatic factors in the short, medium and long term. As with any construction activities there is the risk of negative impacts from air emissions due to increased HGV traffic and construction plant; however these are temporary impacts that can be effectively mitigated for with good site management, planning and good working practices. There is currently no information on the likely SFPC activities that are planned for the site; however it is not thought that they would include any large scale combustion, hazardous gaseous emissions, or significant greenhouse gas emissions.

Due to the low lying location of the site beside the River Shannon it is important that any SFPC development at the Wishbone is adequately designed and protected by defences that have taken predicted climate change impacts into consideration.

8.8.7 Material Assets

There will be some slightly positive impacts of developing this alternative site, however this is not deemed to be significantly positive due to its small size and likelihood as being a secondary site rather than a standalone site. The site can already be accessed directly off the N69 Dock Road via Atlas Avenue and therefore the potential for access improvements is limited.

8.8.8 Cultural Heritage, including Archaeological and Architectural Heritage

The implementation of this alternative site is likely to have a neutral impact with no significant positives or negatives associated with its development. Due to the size of the site and based on the information collated as part of the SIFP process there are no heritage features located within this site.

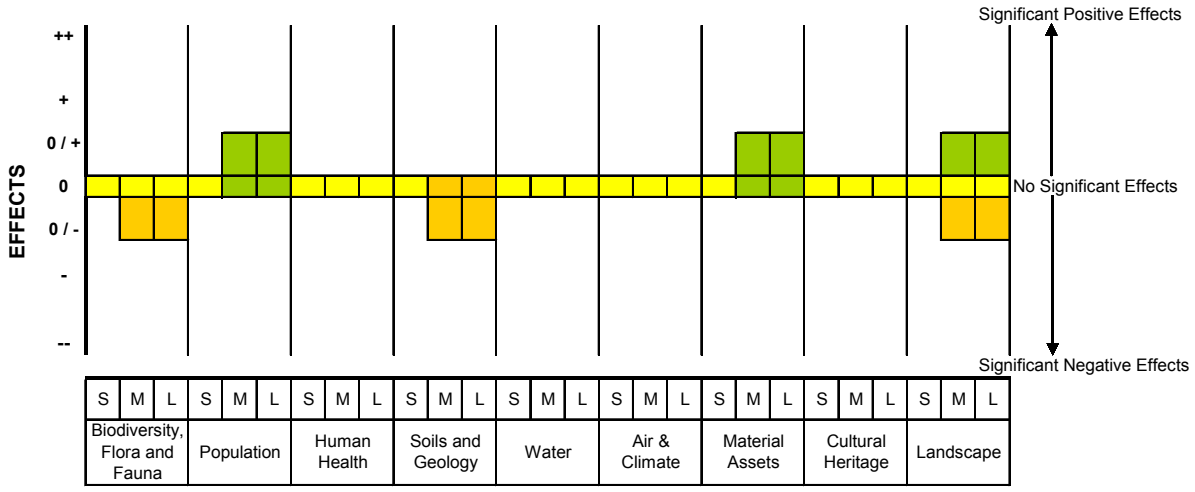
8.8.9 Landscape

Development of SFPC facilities at the Wishbone site has the potential for slight negative impacts on landscape through the loss of a greenfield site that is adjacent to the River Shannon. However there is also the potential for slight positive impacts on the local landscape if the development is done sympathetically, blending with the landscape and river setting.

8.8.10 Alternative 7b Summary

A summary figure of the impacts, and their significance, of implementing Alternative 7b of Vision 2041, development at Limerick Docks The Wishbone is given below in **Figure 8.8**.

Figure 8.8: Assessment Alternative 7b – Limerick Docks The Wishbone



8.8.11 Interrelationship of Effects

The main interrelationship of effects of developing the wishbone would be the positive relationship between material assets and population, and material assets and landscape. The loss of the soil resource as a growing medium will have a negative impact on biodiversity, flora and fauna. Overall, the negative impacts from this site are minimal and can be mitigated at the project level.

8.9 ALTERNATIVE 7C – BANNATYNE MILLS

8.9.1 Biodiversity, Flora and Fauna

There unlikely to be any significant impacts on biodiversity, flora and fauna from the development of this site. Consideration will need to be given to the use of the building by bat species which are protected under the various wildlife legislation in Ireland while it has been left unused. Through careful design and consultation with NPWS any potential significant impacts can be mitigated.

8.9.2 Population

Long-term, direct and indirect positive effects on the surrounding population of Limerick City are likely to result from implementation of this option. The alternative for development of this site has an enormous potential to provide further job opportunities within the city environs. Mixed use zoning would allow for general office use, education, commercial leisure, health services and so on as indicated in the draft Vision 2041 plan. The existing uses at the site and their compatibility with alternative uses and the potential for a health and safety risk would also need to be considered.

8.9.3 Human Health

There are unlikely to be any significant impacts on human health due to the type of alteration or development which is being proposed for this alternative site.

8.9.4 Soils and Geology

Development of the Bannatyne Mill is unlikely to give rise to any significant impacts on soils and geology as is a brownfield site.

8.9.5 Water

Development of the Bannatyne Mill is unlikely to cause any significant impacts on water quality or quantity due to the proposed types of development which are deemed appropriate for this building.

8.9.6 Air and Climate

Development of the Bannatyne Mill is unlikely to cause any significant impacts on air quality, climate and climatic factors due to the proposed types of development which are deemed appropriate for this building.

8.9.7 Material Assets

There will be some slight positive impacts of developing the Bannatyne Mill, however this is not deemed to be significantly positive due to its small size and existing direct access onto the N69 Dock Road therefore the potential for access improvements is limited. Should traffic numbers increase significantly, road alterations such as traffic lights or a roundabout may need to be considered.

8.9.8 Cultural Heritage, including Archaeological and Architectural Heritage

There is great potential for positive impact through restoration and reuse of this heritage feature. Careful consideration of the Victorian features and early consultation with the DAHG will be required to ensure any restoration work is done in a sympathetic manner with the period of the building.

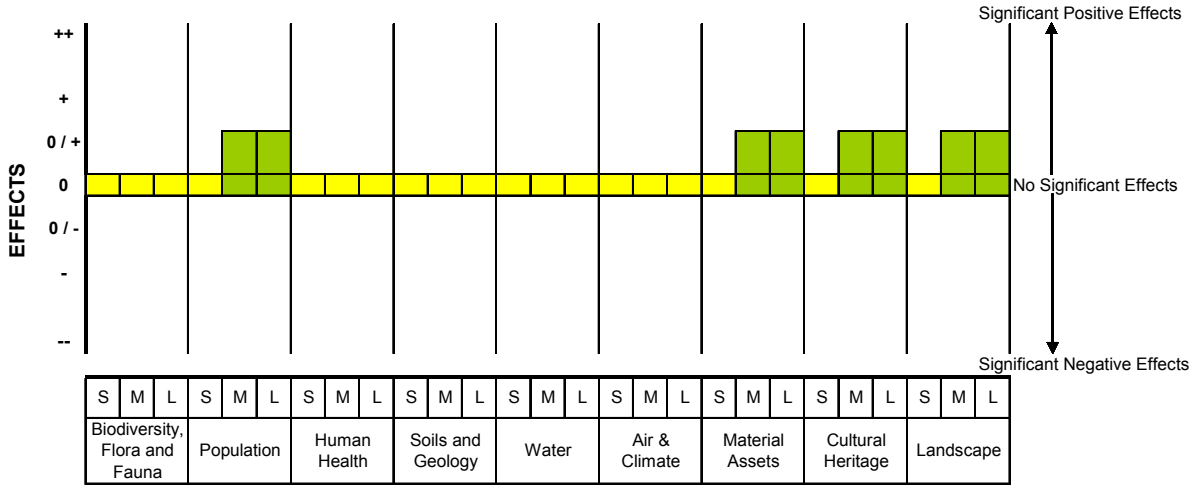
8.9.9 Landscape

There is potential for slight positive impacts on the local landscape if the development is done sympathetically, blending with the landscape and local setting. As the building has been left derelict for some time, improvements or restoration of this building will improve the visual landscape along this busy road network.

8.9.10 Alternative 7c Summary

A summary figure of the impacts, and their significance, of implementing Alternative 7c of Vision 2041, development at Limerick Docks Bannatyne Mills is given below in **Figure 8.9**.

Figure 8.9: Assessment Alternative 7c – Limerick Docks Bannatyne Mills



8.9.11 Interrelationship of Effects

Overall the development of this alternative option is deemed to have no significant negative effects. Interrelationships between cultural heritage, material assets and population could be significantly positive. Restoration of a heritage feature provides a new material asset and potential employment opportunities.

8.10 ALTERNATIVE 7D – SAILORS HOUSE

8.10.1 Biodiversity, Flora and Fauna

Due to the location of Sailors House within an urban centre there is unlikely to be any significant impacts on biodiversity, flora and fauna.

8.10.2 Population

Long-term, direct and indirect positive effects on the surrounding population of Limerick City are likely to result from implementation of this option. The alternative for development of this site has an enormous potential to provide further job opportunities within the city environs. Inner City residential neighbourhood zoning would have a direct positive knock on effect within this area.

8.10.3 Human Health

As the development of this alternative will not require any significant redevelopment or construction work it is unlikely that there will be any significant impacts on human health.

8.10.4 Soils and Geology

As the development of this alternative will not require any significant redevelopment or construction work it is unlikely that there will be any significant impacts on soils and geology as is a brownfield site.

8.10.5 Water

Due to the location of Sailors House it is unlikely that there will be any significant impacts on water quality or quantity from future site development.

8.10.6 Air and Climate

As the development of Sailors House for future use will not require any significant redevelopment or construction work it is unlikely that there will be any significant impacts on air quality, climate and climatic factors from implementation of this option.

8.10.7 Material Assets

There is potential for slight positive impacts of developing new facilities at the site but this is thought to be limited given its current location and access from the city centre.

8.10.8 Cultural Heritage, including Archaeological and Architectural Heritage

There has already been significant refurbishment and maintenance work taken place on this building which can be seen as a positive impact through restoration and reuse of a heritage feature.

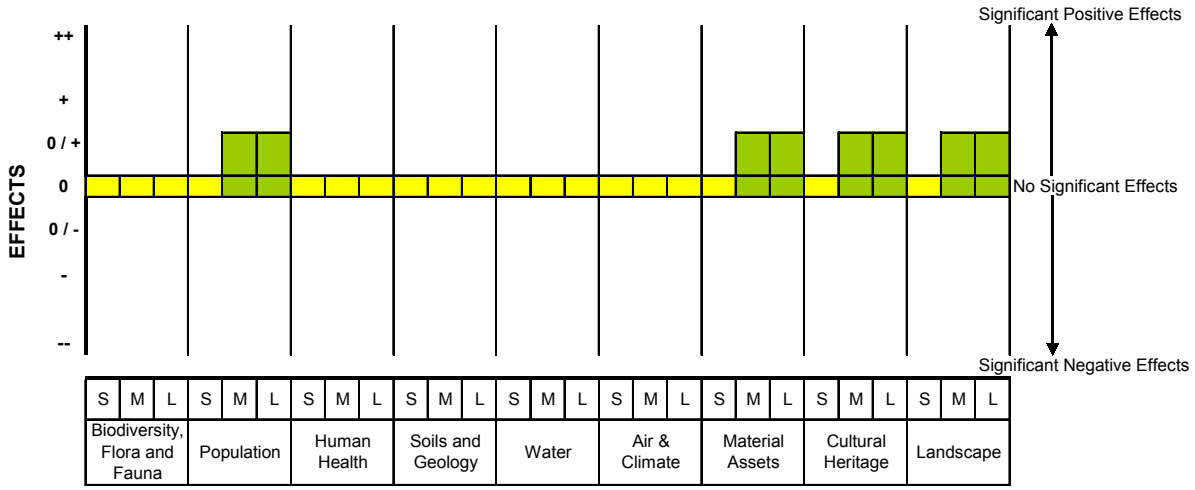
8.10.9 Landscape

There has already been significant refurbishment and maintenance work taken place on Sailors House which can be seen as a positive impact on the local landscape. If any future development is done sympathetic blending with the landscape and local setting will be required to ensure the impacts are deemed to be positive.

8.10.10 Alternative 7d Summary

A summary figure of the impacts, and their significance, of implementing Alternative 7d of Vision 2041, development at Limerick Docks Sailors House is given below in **Figure 8.10**.

Figure 8.10: Assessment Alternative 7d – Limerick Docks Sailors House



8.10.11 Interrelationship of Effects

Overall the development of this alternative option is deemed to have no significant negative effects. The effects are deemed to be neutral or positive. Interrelationships between cultural heritage, material assets and population will be significantly positive. Restoration of a heritage feature provides a new material asset and potential employment opportunities.

8.11 CUMULATIVE EFFECTS BETWEEN ALTERNATIVES

The below table provides a summary of the potential for cumulative effects on the environment between the alternatives if SFPC decide to implement a combination of options throughout the Vision 2041 period.

Alternative	2	3	4	5	6	7a	7b	7c	7d
2 – Effective Utilisation									
3 – Foynes Expansion	**+ / -**								
4 – Foynes Remote Operations	**+ / -**	**+ / -**							
5 – Foynes Additional Berthing	**+ / -**	**++ / -**	**++ / -**						
6 – Foynes Deep Water Berthing	**+ / -**	**++ / -**	**++ / -**	**0 / --**					
7a – Limerick Corcanree	**0**	**0**	**0**	**0**	**0**				
7b – Limerick – The Wishbone	**0**	**0**	**0**	**0**	**0**	**++ / 0**			
7c – Limerick – Bannatyne Mill	**0**	**0**	**0**	**0**	**0**	**+ / 0**	**0**		
7d – Limerick – Sailors House	**0**	**0**	**0**	**0**	**0**	**+ / 0**	**0**	**+ / 0**	

Key to Potential Impacts:

++ Significant positive cumulative impact.

+ Positive cumulative impact.

0 No cumulative impact.

- Negative cumulative impact.
-- Significant negative cumulative impact.

The joint implementation of various Vision 2041 alternatives at the Port of Foynes has the potential for positive and negative cumulative effects. The greater the number of alternatives implemented the greater the potential negative impacts on biodiversity, flora, fauna, water, soils air and climate, as the development footprints and operational footprints of SFPC facilities encroach more into greenfield sites and habitats. However, conversely the greater the number of alternatives implemented the greater the potential for positive impacts on material assets and population, as more SFPC facilities become available the greater the mutual benefit they have to one another, the more the indirect assets created and the greater the potential for employment opportunities.

The joint implementation of various Vision 2041 alternatives at the Limerick Docks is likely to have more positive cumulative impacts as the sites generally have a lower potential for negative environmental impacts and their implementation is more mutually beneficial. The distance between the Foynes and Limerick Docks facilities means there is unlikely to be significant positive or negative cumulative impacts between their respective alternatives.

In the assessment it can be seen that there may be significant positive impacts from development of both the Bannatyne Mill and Sailors House, however in reality there may not be the need to restore / re-use both of these facilities, which are slightly remote from one another.

8.12 ALTERNATIVES ASSESSMENT CONCLUSIONS

A summary of all the assessment graphic outputs is shown on the next page, the purpose of which is to demonstrate the relative impacts of the various options. Generally the greatest negative environmental impacts can be seen where there is the greatest development footprint and therefore greatest disturbance to the natural environment. At the same time however the greater the development area the more positive the impacts for material assets and population, whereas there will be more assets created, which in turn gives the potential for more employment, and then indirect secondary development of assets and employment may be created following this.

It may be essential to co-develop alternatives from Vision 2041 to make them truly effective. Expanding operations at Foynes or Askeaton may not be feasible if the Port is limited to current berthing facilities and thus limited vessel sizes and numbers. However, as outlined in **section 8.11**, it is likely that the combination of creating additional berthing at Foynes, as well as new deepwater berthing facilities at Foynes Island would create significant negative environmental impacts to the biodiversity, flora, fauna and water quality in the area.

The Limerick Docks Alternatives 7b, 7c and 7d are, by themselves, relatively low in environmental impacts. However these alternatives, by themselves, also offer only slight positive impacts. It may be essential to co-develop some of the Limerick Dock Alternatives to provide cost benefits, minimise construction impacts by doing it once, and be mutually beneficial. For example the co-development of the Corcanree site with the Wishbone site, or the co-development of these two sites alongside the development of Bannatyne Mill, which is in the vicinity.

Alternatives 3, 4, 5, 6, 7a and 7b are all likely to be subject to an environmental impact assessment under the Planning and Development Acts, the Planning and Development Regulations 2001 - 2002 and European Communities (Environmental Impact Assessment) Regulations 1989 - 2006, due to the likelihood for environmental impacts and the scale of development as Part I Development Type 8 or Part II Development Type 10(a), 10(d)(iii), or 12c(ii).

Potential mitigation measures for the predicted negative environmental impacts are proposed in **Section 9** to reduce the significance of these impacts. These mitigation measures will need to be incorporated within the project level planning and design of the alternatives.

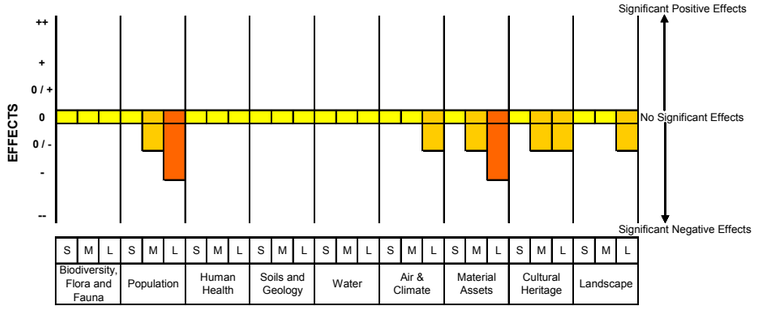
Due to the strategic nature of Vision 2041 which is focused upon driving growth across all sectors there still remains a considerable amount of uncertainty as to the exact scale, type and location of development within the Strategic Sites identified in from the SIFP and associated with the objectives of the Vision. However, by undertaken the appropriate assessment process it is hoped that the most significant effects can be eliminated at project level through avoidance and removal of elements with the likelihood of the most significant effects. In the case of any remaining scientific uncertainty with

regard to the effects of the plan at project level or the related mitigation (or compensatory measures should they be deemed necessary under Article 6(4)), the measures should include a pre-defined and validated scheme to monitor the actual impacts and a framework to adapt the mitigation and compensation measures to the actual impacts once the project level details are brought forward.

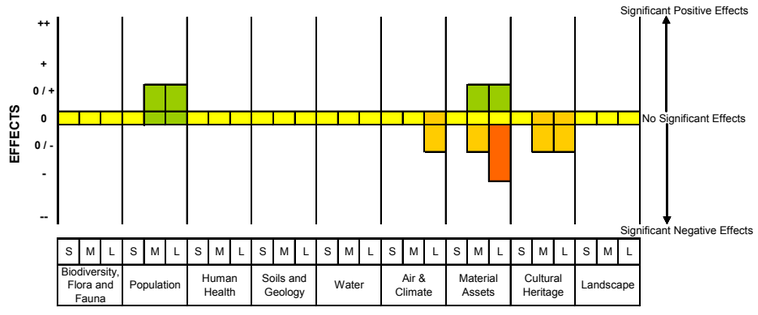
The assessment recognises that a significant amount of further evaluation will be required however, at project level, to assess the potential interrelationships between specific proposals and the natural environment, and understand the nature of the benefits and the impacts. It is hoped that the information provided in the Vision and its associated environmental assessment will also provide direction for such proposals as they are brought forward to the planning stage.

Despite the many unknown factors associated with any future development by SFPC there are a number of generic activities that are likely to occur as a result of implementation of some of the Vision objectives. Therefore future development was examined under a number of key sector headings as outlined in the draft SIFP, which have been identified as both economic drivers / key growth areas. Where activities at different stages of the development are likely to occur associated with the various sectors from surveying through installation/construction, operation to decommissioning and infrastructure removal they may have similar effects on interest features and have therefore been grouped accordingly. The assessment of potential effects is therefore not directly related to the publication of the Vision itself but rather the realisation of projects over time through the implementation of the Vision on the ground.

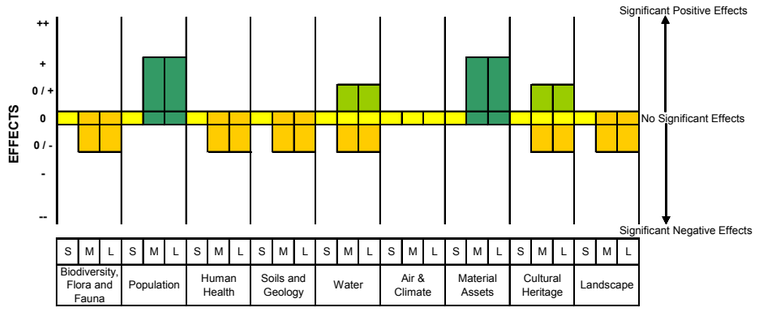
Alternative Assessment 1 – Do Nothing



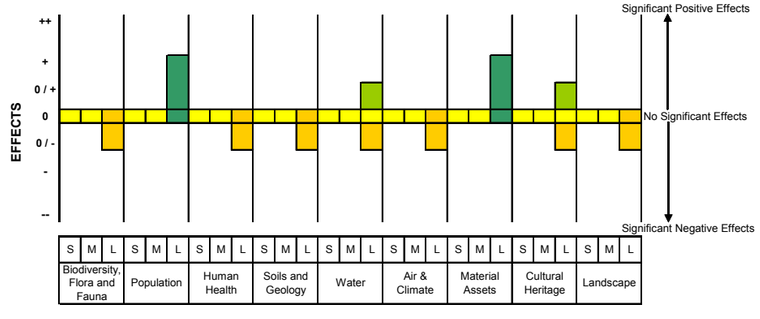
Alternative Assessment 2 – Utilisation of Existing Assets



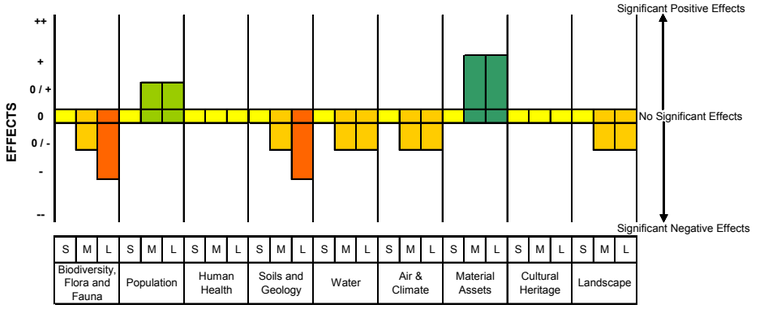
Alternative Assessment 3 – Port of Foynes Estate Expansion



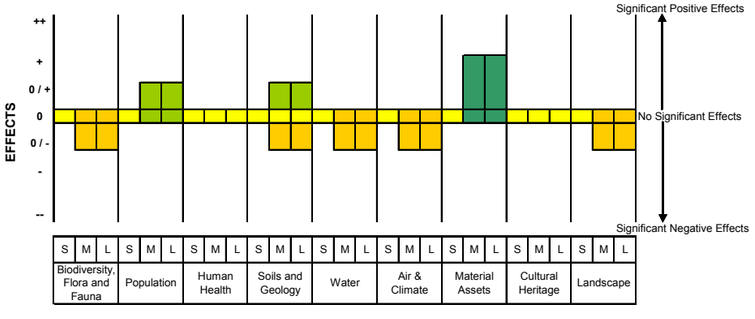
Alternative Assessment 4 – Port of Foynes Remote Operations



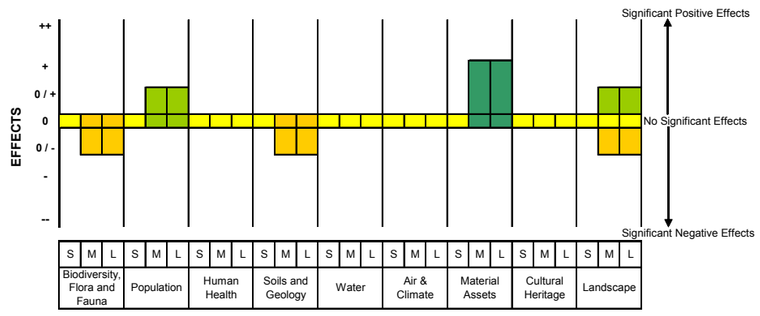
Alternative Assessment 5 – Additional Berthing Facilities Foynes



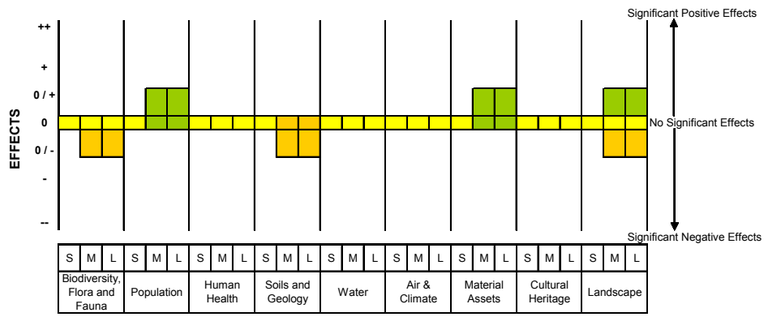
Alternative Assessment 6 – Deep Water Berthage Foynes Island



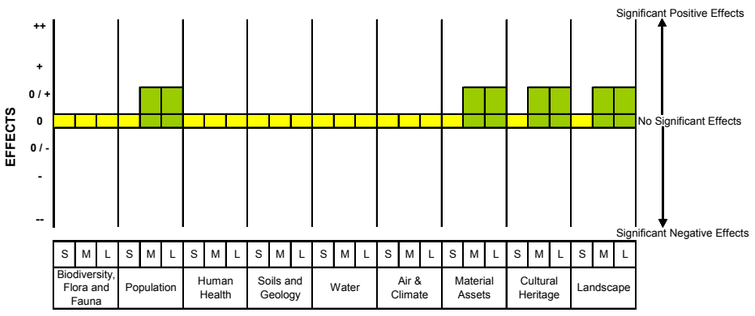
Alternative Assessment 7a – Corcanree Business Park



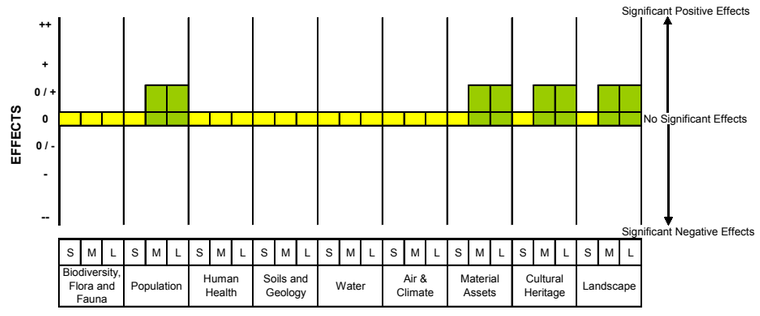
Alternative Assessment 7b – The Wishbone



Alternative Assessment 7c – Bannatyne Mill



Alternative Assessment 7d – Sailors House



9 MITIGATION AND MONITORING

9.1 MITIGATION

Table 9.1 gives a summary of the potential impacts/problems that could be encountered in the implementation of Vision 2041 options and potential mitigation measures for these impacts. Some of these options will have permanent residual impacts, due to development footprint, that cannot be mitigated for unless SFPC create new areas of equal habitat for each area of habitat that is lost. However the potential for this is not included within Vision 2041.

Table 9.2 gives a summary of the potential impacts/problems to Natura 2000 sites in the area from implementation of the Vision 2041 options and potential mitigation measures for these impacts.

Table 9.1: Potential Impacts and Mitigation

Topic	Alternative	Impact / Problem	Mitigation
A / C	3, 4, 5, 6, 7a, 7b, 7c, 7d	During the short term construction period there may be additional air emissions (exhaust, dust etc) from plant and machinery.	These emissions can be kept to a minimum with appropriate construction site management and maintenance of equipment. General good working practices.
A / C	3, 4, 5, 6, 7a, 7b	Increased road traffic and emissions.	Good traffic planning will be required. However there would be expected to be continually improving engine technology, cleaner fuels and stricter emissions standards over the coming years (DMRB, 2007).
A / C	3, 4, 5, 6	Increase in boat numbers and boat sizes causes increased air pollution from emissions.	Good management of vessel movements in the estuary and around the berthing areas. Enforcement of cleaner fuel use while berthed. New legislation on marine fuels and emissions, coupled with improvements in engine technology should lessen some of the potential impact. Siting of berthing areas away from sensitive receptors.
A / C	3, 4, 5, 6	Increased emissions from new port equipment.	Good site management to optimise crane and transport movements. Use of BAT with a view to reducing emissions.
BFF	3, 4, 5, 6, 7a, 7b	Temporary displacement of marine / estuarine / riverine fauna during the construction period.	Good planning and timing, prior to sensitive construction methods is essential. Potentially using NRA construction guidelines, e.g. *On Crossing of Watercourses, On Treatment of Otters* etc, and Eastern Fisheries Board *Requirements for the protection of fisheries habitat during construction and development works at river sites.*
BFF	3, 4, 5, 6, 7a, 7b	Temporary displacement of terrestrial fauna during the construction period.	Good planning and timing, prior to sensitive construction methods is essential. Retaining protected vegetation, potential roost/sett locations and hedgerows/wildlife corridors where possible. Detailed

Topic	Alternative	Impact / Problem	Mitigation
			ecological assessment during planning and appropriate ecological monitoring during construction.
BFF	3, 4, 6, 7a, 7b	Permanent loss of terrestrial habitat from development footprint.	Design in green areas to the development where possible, such as the use of green roofs, ponds and scrub areas to maintain biodiversity and attract fauna. Maintain existing wildlife corridors, hedgerows and trees where possible in the development design.
BFF	5, 6	Potential for impacts to inquisitive marine mammals during construction.	Marine mammal spotter in operation during dredging and construction in the estuary. Stopping all works when marine mammals are present. Use of deterrent noises prior to and during construction, with “soft-start” to gently deter mammals from the area.
BFF	5, 6	Medium and long-term disturbance to marine / estuarine fauna in the area.	Strict environmental regulations on berthing/hotelling vessels. Low speed limits within the estuary. No spill or discharges to the estuary from vessels.
BFF	5, 6	Impact on Natura 2000 habitats and species from construction and maintenance dredge activities.	Good construction and management practices should be able to keep all impacts to a minimum. The mitigation measures as outlined in the NIR should be used to mitigate effects.
BFF	5, 6	Impact on Natura 2000 habitats and species from increased vessel numbers.	Adherence to the avoidance and mitigation measures which have been detailed under the Shipping and Navigation Sector and Marine Related Industry Sector of the NIR.
C / W	3, 4, 5, 6, 7a, 7b, 7c, 7d	Climatic change and climatic variability impacts on new infrastructure and facilities.	Ensure new SFPC facilities are designed and built with predicted climatic change in mind, e.g. greater potential for flooding, water level rises and increased rainfall duration and intensity.
CH	3, 4, 5, 6, 7a, 7b, 7c, 7d	Potential for loss of heritage features during construction activities.	Construction supervision by qualified archaeologists, combined with sensitive construction methods and restoration would

Topic	Alternative	Impact / Problem	Mitigation
			mean this damage or destruction could be kept to a minimum. Heritage features discovered could be restored as an attraction.
CH	5, 6	Potential for underwater heritage sites to be impacted upon by construction dredging operations.	Interpretation of side-scan sonar and bathymetry information, along with supervision of construction dredging operations by qualified archaeologists will minimise any impacts or the possibility of destruction of underwater heritage features.
HH	3, 4, 5, 6, 7a, 7b, 7c, 7d	Increased nuisance dust and noise emissions from construction causing annoyance to Public.	Disturbances and nuisance can be kept to a minimum with good working practices and planning.
HH	3, 4, 5, 6	Nuisance dust and noise emissions from Port operations / Port traffic causing annoyance to Public.	Strict environmental regulation of the site. Strict adherence to the Port of Foynes Environmental Management Plan. Banning of contractors that contravene Port policy.
L	3, 4, 5, 6, 7a, 7b, 7c, 7d	New SFPC facilities spoiling landscape and vistas.	Ensure new SFPC facilities are designed to blend with the local environment and landscape context.
L	5, 6	Increased vessel numbers affecting views of the estuary. Vessels impacting on the natural setting.	Good management of vessel movements in the estuary and around the berthing areas.
L	3, 4, 5, 6, 7a, 7b, 7c, 7d	Extent and severity of short term negative impacts on landscape from construction.	Impacts could be kept to a minimum through good site practice and planning (eg. screened laydown areas and traffic management).
MA	3, 4, 5, 6, 7a, 7b, 7c, 7d	Loss of agricultural land.	Any loss of productive agricultural land will mitigated as appropriate in consultation with the landowner.
S	3, 4, 6, 7a, 7b	Permanent loss of soil resource due to development footprint.	Development on brownfield sites rather than greenfield sites. Re-use of soil material where possible on site and not importation of soils from other sites.

Topic	Alternative	Impact / Problem	Mitigation
W	3, 4, 5, 6, 7a, 7b, 7c, 7d	Disturbances of water quality during the construction phase	Good management and planning to keep disturbance to a minimum. Any potential water quality issues from construction could be contained and treated to ensure no damage to natural waterbodies. Dredging and construction within or near natural waterbodies will have to be planned appropriately, using BAT at all times, to ensure water quality issues are kept to a minimum, with no significant adverse effects. Guidelines such as CIRIA Document C532 - Control of Water Pollution from Construction Sites and CIRIA documents C521 - SUDS - Design manual for Scotland and NI, and C523 - SUDS - Best Practice Manual to be adhered to.
W	5, 6	Potential for disturbance during maintenance dredging.	Using good planning, timing and BAT, there should be only minimal temporary disturbance to the local water quality.
W	5, 6	Increased vessel numbers in the estuary has the potential to increase pollution incidents.	Strict management and regulation of vessels accessing SFPC facilities. The provision of good facilities at Port of Foynes or Foynes Island could help prevent pollution incidents. Preparation of emergency response plans.

BFF- Biodiversity, Flora, Fauna. P – Population. HH - Human Health. S – Soils. W – Water. A – Air Quality. C – Climate. MA – Material Assets. CH – Cultural Heritage. L – Landscape

In the context of the Vision, mitigation measures as part of the appropriate assessment are put forward to prevent, reduce and, as fully as possible, offset any predicted significant adverse effects on the environment through implementation of the Vision. They are formulated based on impact assessment results and enable integrating SEA and AA findings into the proposal. Mitigation measures can generally be hierarchically divided into those that:

- Avoid the identified potential effects – which generally entail removing objectives that have an impact on the environment
- Reduce the magnitude, extent, probability or severity of potential effects – which commonly entails re-wording of the objectives
- Offset effects after they have occurred – which entail devising positive measures to compensate for biodiversity impacts deriving from unavoidable actions (this is often the case in light of a statement of case for IROPI). This option is considered, to some extent, a remedial action

Four tiers of mitigation have been adopted in the appropriate assessment process and documented in this Natura Impact Report as follows;

- The inclusion of appropriate assessment criteria at the forefront of the site selection process through the SIFP process which utilised Preliminary Screening Tables and Multi Criteria Analysis to ensure sites with the highest risk of impact to Natura 2000 sites were scored accordingly in terms of the potential for impact. Vision 2041 has taken on board the findings of this process.
- Appropriate Assessment of the Strategic Sites as outlined in **Chapter 6 of the NIR** provides mitigation on the qualifying interest features specific to each Strategic Site which covers the locations under SFPC jurisdiction.
- Overarching mitigation measures arising from the appropriate assessment of the Vision in general as outlined in **Chapter 7 of the NIR.**
- General mitigation measures per sector as outlined in **Chapter 7 of the NIR**

This assessment aims to inform the future development in particular of Foynes Port as is outlined in the Vision, the Port of Foynes is the one facility on the Estuary most likely to experience significant change over the period of Vision 2041

9.2 MONITORING

Article 10 of the SEA Directive requires that monitoring should be carried out in order to identify at an early stage any unforeseen adverse effects due to implementation of Vision 2041, with the view to taking remedial action where adverse effects are identified through monitoring. A monitoring programme is developed based on the indicators selected to track progress towards achieving strategic environmental objectives and reaching targets, enabling positive and negative impacts on the environment to be measured. The environmental indicators have been developed to show changes that would be attributable to implementation of the Plan. **Table 9.4** shows the targets and indicators for monitoring and who would potentially be the responsible body or organisation.

Table 9.3: Environmental Monitoring

SEA Target	SEA Indicators	Potential Responsible Authority	Possible Data Availability, Source and Frequency
No deterioration of habitats or their associated species due to implementation of the Masterplan (BFF)	Status of EU Protected Habitats and Species and status of national Priority Species and Habitats. Condition of Selection Features in sites designated for nature conservation (SACs, SPAs and NHAs).	NPWS	NPWS Species Action Plan Status of Protected Sites and Species in Ireland Report (Every 6 years)
No increased spread of Alien Species and their associated impact to the aquatic environment due to implementation of the Masterplan (BFF)	Geographical spread and number of Alien Species in the area.	NPWS	National Invasive Species Database
Increased investment in the region (P)	Number of new businesses established near to the SFPC facilities.	CSO	CSO annual statistics. Census data (every 10 years). Department of Finance
Increased tourism levels in the region (P)	Number of tourist visits to the region.	Tourism Boards	Tourism Boards Annual Reporting.
Increased employment opportunities in the region (P)	Unemployment statistics in the region.	CSO	CSO annual statistics. Census data (every 10 years). Department of Finance
Provide new, safe, public recreational facilities in the region with access for all (HH)	Increased public use of local recreational facilities. Number of tourist visits to the region. Number of accidents associated with SFPC facilities.	Tourism Boards Health & Safety Authority (HSA) SFPC	Tourism Boards Annual Reporting Health and Safety Authority Annual statistics SFPC health and safety reporting
Prevent nuisance dust and odours emanating from port activities (HH)	Health issues and nuisance complaints associated with port activities.	SFPC Local Authority EPA	SFPC monitoring Public Complaints Air Quality in Ireland Report (Annual)
Avoid sterilisation of a usable or natural soil resource (S)	Area and zoning of land use from SFPC infrastructure. Encroachment into areas of non industrial / commercial land.	Local Authority Geological Survey Ireland (GSI) EPA	Landcover and land use mapping Local Area Plan revisions

SEA Target	SEA Indicators	Potential Responsible Authority	Possible Data Availability, Source and Frequency
No deterioration of water status up or downstream of SFPC facilities, due to development or operation (W)	WFD water status of surface and groundwaters in the area.	Local Authority EPA	WFD Water Status Report 2015
No exceedences of air quality standards due to SFPC facility development or operation (A)	Air quality/air pollutants levels at SFPC facilities and Zone D in general	EPA Local Authority	Air Quality in Ireland Report (Annual)
No significant increase in background air pollutant levels in the region of SFPC facilities, due to the implementation of the Plan (A)	Increased road and boat traffic in the area	NRA SFPC Local Authority	Road traffic counts and annual traffic reports Air Quality in Ireland Report (Annual)
Compliance with odour and dust criteria to prevent deterioration in amenity (A)	Increase in number of odour and dust complaints, because of development or operation	EPA Local Authority	IPPC Licence Monitoring and Odour complaint statistics
Minimise GHG emissions from development and operation (C)	GHG emissions in the region.	EPA	GHG Emissions Data Reporting and National (GHG) Inventory Reports
No net loss of CO_2 sequestering vegetation in the area (C)	Loss or gain of vegetation in development area	GSI EPA DAFF	Landcover and land use mapping.
Employ BAT and renewable energy within development and operation of facilities where possible (C)	Use of “green energy” in the operation of SFPC facilities. Port energy use.	SFPC	Energy consumption statistics
Develop SFPC facilities at Foynes and Limerick (MA)	Number and extent of facilities at Foynes and Limerick.	SFPC Local Authority	As built drawings.
Maintain operations at all SFPC facilities (MA)	Maintenance of operations.	SFPC	SFPC reporting
Provide vehicle for investment in local infrastructure (MA)	Capital invested in local infrastructure. Augmentation of local infrastructure, e.g. number of new roads built, old roads updated, treatment plants updated etc, due to Plan.	SFPC Local Authority Department of Finance CSO	Local investment annual or census statistics

SEA Target	SEA Indicators	Potential Responsible Authority	Possible Data Availability, Source and Frequency
Restore port related cultural heritage features (CH)	Number of heritage features restored as part of the Masterplan. Number of new heritage features discovered in the Masterplan timescale.	Heritage Council Heritage Ireland Local Authorities National Monuments Service	The Archaeological Survey monitoring programme Heritage Council Ireland Sites and Monuments Database
Provide public access to cultural heritage features within SFPC lands (CH)	Number of heritage features accessible to the public for educational purposes.	Heritage Council Heritage Ireland Local Authorities National Monuments Service	The Archaeological Survey monitoring programme Heritage Council Ireland Sites and Monuments Database
Avoid damage to any cultural heritage features in development and/or operation of SFPC facilities (CH)	Number of heritage features lost or destroyed due to the implementation of the Masterplan.	Heritage Council Heritage Ireland Local Authorities National Monuments Service	The Archaeological Survey monitoring programme Heritage Council Ireland Sites and Monuments Database
No damage to local vistas and landscape in the area of SFPC facilities (L)	Significant negative changes in land cover types. Percentage changes in land cover types in areas with a high sensitivity to change. Changes in landscape character definitions.	EPA GSI Local Authority	Landscape Character Areas Landcover Mapping Local Area Plans (EHSA)
Enhance the local vistas and landscape where possible, with sensitive and sustainable development practices (L)	Significant negative changes in land cover types. Percentage changes in land cover types in areas with a high sensitivity to change. Changes in landscape character definitions.	EPA GSI Local Authority	Landscape Character Areas Landcover Mapping Local Area Plans (EHSA)

BFF- Biodiversity, Flora, Fauna. P – Population. HH - Human Health. S – Soils. W – Water. A – Air Quality. C – Climate. MA – Material Assets. CH – Cultural Heritage. L – Landscape.

10 NEXT STEPS

Following the release of this environmental report for the SEA of SFPC Vision 2041 the main proposed processes and dates to implementing the Plan will be as detailed in **Table 10.1**.

Table 10.1: Proposed Processes and Dates for Implementing Vision 2041

Dates	Environmental Assessment	Plan
2nd January 2013	Draft Environmental Report & Draft Natura Impact Report Publication	Draft Vision 2041 Publication
2nd January – 31st January 2013	Public Consultation	
February 2013	SEA Statement	Final Vision 2041 Publication

It is envisaged that Vision 2041 will be reviewed every 6 to 10 years. The SEA of Vision 2041 will therefore be reviewed on the same timeframe.

Written submissions or observations for the draft SEA of SFPC Vision 2041, associated Environmental Report and Natura Impact Report are now invited. Written submissions can be made to Sheila Downes at the below address before the 31st of January 2013.

Sheila Downes
Senior Engineer/Scientist - RPS
Consulting Engineers, Mulkear House, Newtown Centre,
Annacotty, Co Limerick.
Ireland
Email: sheila.downes@rpsgroup.com

GLOSSARY

Abbreviation	Explanation
AA	Appropriate Assessment
DCENR	Department of Communications, Energy and Natural Resources
DEHLG	Department of Environment, Heritage and Local Government
DoE	Department of Environment
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
EU	European Union
HMWB	Heavily Modified Waterbody
NHA	Natural Heritage Area
NIR	Natura Impact Report
NPWS	National Parks and Wildlife Service
SEA	Strategic Environmental Assessment
SAC	Special Area of Conservation
SMR	Sites and Monuments Record
SPA	Special Protection Area
WFD	Water Framework Directive
WWTW	Waste Water Treatment Works

APPENDIX A

Written Screening/Scoping Comments

Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

Regional Inspectorate, Inniscarra
County Cork, Ireland

Cigireacht Réigiúnach, Inis Cara
Contae Chorcaí, Éire

T: +353 21 487 5540
F: +353 21 487 5545
E: info@epa.ie
W: www.epa.ie

LoCall: 1890 33 55 99

Mr Pat Keating
Chief Executive
Shannon Foynes Port Company
Harbour Office
Foynes
Co. Limerick

23rd November 2011

Our Ref: 111001.1

Re. Preparation of the Shannon Foynes Port Company Master Plan – Strategic Environmental Assessment (SEA) Screening Statement

Dear Mr Keating,

The Environmental Protection Agency (EPA) acknowledges your notice, dated 10th October 2011, regarding the above and notes its contents.

SEA Determination

The EPA considers there is potential for likely significant effects to arise from the implementation of the proposed Master Plan. This is particularly in the case of water, biodiversity and related environmental aspects. It is also considered that Flood Risk is an aspect that merits detailed assessment and consideration when determining the overall direction and the preferred option(s) for the ongoing sustainable development of Limerick Docks and the Port of Foynes. The potential for significant effects in implementing the Master Plan, in particular cumulative effects associated with other relevant Plans and Programmes should also be determined

The development of the proposed Master Plan should be aligned with the development of the Shannon Integrated Framework Plan for which SEA is currently being undertaken in accordance with the SEA Directive and associated regulations. It is considered that finalisation of the Master Plan should be informed by the outcome of the completed SIFP process and associated SEA and Appropriate Assessment under the Habitats Directive.

It should be ensured that any development arising from the implementation of the Master Plan complies with the assessment requirements of the Habitats Directive and associated Birds and Habitats Regulations (*European Communities (Birds and Natural Habitat Regulations) 2011* - S.I. No 477 of 2011) in particular in relation to the Shannon & Fergus Estuaries SPA and Lower River Shannon SAC. In this context, clarification should be given on the status of Appropriate Assessment Screening in relation to the proposed Master Plan. In the event that a determination is made that AA is required, this should be reflected in the determination for the requirement for SEA.

In determining the proposed expansion of the port, the alternative spatial development locations should be assessed for likely significant effects on the environment and should ensure relevant environmental obligations are complied with. It is noted that in *Section 3.1.1* of the SEA Screening Report that there is an intention to carry out extensive baseline and

environmental researching prior to the development of the Master Plan area. This should be carried out at Plan level initially with a view to informing project level assessments.

Further to the specific comments provided above, please find attached an SEA guidance document to ensure the integration of environmental considerations into the Plan to be considered where relevant and appropriate.

Future Amendments to the Draft Plan
You are reminded that it is a matter for Shannon Foynes Port Company and adjacent Local Authorities (Limerick County / Limerick City Councils, where relevant, to determine whether or not any future proposed Amendments/Variations/Alterations would be likely to have significant effects on the environment. This assessment should take account of the SEA Regulations Schedule 2A Criteria (S.I. No. 436 of 2004).

Appropriate Assessment
You are referred to the requirements of Article 6 of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, the Habitats Directive. Appropriate Assessment, in accordance with the Directive, is required for:

"*Any plan or project not directly connected with or necessary to the management of the site (Natura 2000 sites) but likely to have significant effect thereon, either individually or in combination with other plans or projects, shall be subject to Appropriate Assessment of its implications for the site in view of the sites conservation Objectives...*"

You should consult with the National Parks and Wildlife Service (NPWS) with regard to screening of the Plan for Appropriate Assessment. Where Appropriate Assessment is required, any findings or recommendations should be incorporated into the SEA and Plan, as appropriate.

Obligations with respect to National Plans and Policies and EU Environmental Legislation
You are referred to your responsibilities and obligations in accordance with all national and EU environmental legislation. It is a matter for Shannon Foynes Port Company to ensure that, when undertaking and fulfilling their statutory responsibilities; they are at all times compliant with the requirements of national and EU environmental legislation.

Updated SEA Regulations / Circular
Your attention is brought to the new SEA Regulations, which should be referenced and integrated into the Plan and SEA process.

Two amending SEA Regulations were signed into Irish law on the 3rd May 2011, amending the original SEA Regulations:

- European Communities (Environmental Assessment of Certain Plans and Programmes) (Amendment) Regulations 2011, (S.I. No. 200 of 2011), amending the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (S.I. No. 435 of 2004), and

- Planning and Development (Strategic Environmental Assessment) (Amendment) Regulations 2011, (S.I. No. 201 of 2011), amending the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (S.I. No. 436 of 2004).

You are also referred to the recent DoECLG Circular (PSSP 6/2011) issued on the 26th July 2011 to each County/City Manager, Director of Services and Town Clerk in relation to

'Further Transposition of the EU Directive 2001/42/EC on Strategic Environmental Assessment (SEA)' which should also be referred to and integrated into the Plan.

European Communities (Birds and Natural Habitats) Regulations 2011

You are also referred to the requirements of the recent European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011), which should be taken into account in implementing the Plan. These Regulations consolidate the European Communities (Natural Habitats) Regulations 1997 to 2005 and the European Communities (Birds and Natural Habitats) (Control of Recreational Activities) Regulations 2010, as well as addressing transposition failures identified in the CJEU judgements.

Environmental Authorities

You are reminded of the requirement, where appropriate under the SEA Regulations, and as amended by S.I. No. 201 of 2011, to give notice to the following:

- The Environmental Protection Agency

- The Minister for the Environment, Community & Local Government

- Minister for Agriculture, Marine and Food, and the Minister for Communications Energy and Natural Resources, where it appears to the planning authority that the plan or programme, or modification of the plan or programme, might have significant effects on fisheries or the marine environment

- where it appears to the competent authority that the plan or programme, or amendment to a plan or programme, might have significant effects in relation to the architectural heritage or to nature conservation, the Minister for Arts, Heritage and Gaeltacht Affairs, and

- any adjoining planning authority whose area is continuous to the area of a planning authority which prepared a draft plan, proposed variation or local area plan.

You are further reminded that a copy of your decision regarding the determination should be made available for public inspection at your offices, local authority website and should also be notified to any Environmental Authorities already consulted.

Should you have any queries or require further information in relation to the above please contact the undersigned. I would be grateful if an acknowledgement of receipt of this submission could be sent electronically to the following address: sea@epa.ie.

Yours sincerely,

Tadhg O'Mahony
Senior Scientific Officer
SEA Section
Office of Environmental Assessment
Environmental Protection Agency
Regional Inspectorate
Inniscarra, County Cork

Shannon Foynes Port Company Vision 2014 (Masterplan) SEA Screening Determination and Initial Scoping

From: Nicola Foley [foleyni@epa.ie]
Sent: 08 August 2012 15:47
To: Sheila Downes
Cc: masterplan@sfpc.ie
Subject: EPA Submission RE: Shannon Foynes Port Company Vision 2014 (Masterplan) SEA Screening Determination and Initial Scoping Notification

Attachments: SCP120701.1 EPA Submission Shannon Foynes Vision 2014 Masterplan_Cover.pdf; SCP120701.1 EPA Submission Shannon Foynes Vision 2014 Masterplan.pdf; SCP120701.1 Integration Checklist Shannon Foynes Vision 2014 Masterplan.docx; 111001.1 EPA Screening Submission ShannonFoynes Port MasterPlan.pdf; SEA Pack 2012.pdf

Dear Ms Downes,

I refer to and acknowledge your correspondence, dated 16th July 2012, in relation to the Strategic Environmental Assessment Screening Determination and Initial Scoping Notification for the Shannon Foynes Port Company Vision 2014 (Masterplan), hereafter referred to as “the Masterplan”.

The EPA notes and welcomes the SEA screening determination to undertake SEA, particularly in the context of the contents of the SEA screening response issued by the EPA on 23rd November 2011, which is attached for reference.

As stated in the EPA ‘s previous correspondence, the development of the proposed Master Plan should be aligned with the development of the Shannon Integrated Framework Plan for which SEA is currently being undertaken in accordance with the SEA Directive and associated regulations. It is considered that finalisation of the Master Plan should be informed by the outcome of the completed SIFP process and associated SEA and Appropriate Assessment under the Habitats Directive.

In determining the proposed expansion of the port, the alternative spatial development locations should be assessed for likely significant effects on the environment and should ensure relevant environmental obligations are complied with.

Please find enclosed the EPA’s initial submission, which consists of a SEA Scoping Integration Document, SEA Integration Checklist and SEA Pack to assist you in undertaking an environmental assessment as per the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (S.I. No. 436 of 2004).

Specific Comments to be considered

- The surface water quality of the Dooncaha Stream and Ahacronane River was classified as being of poor quality (Q3 in 2011) by the EPA, and as being of poor status under the Water Framework Directive. Areas of high/extreme groundwater vulnerability were also identified within the Plan area by the Geological Survey of Ireland. The Plan should include policies/objectives for the protection and improvement of surface and ground waters within and adjacent to the Plan area. In addition, you are referred to the Shannon International River Basin Management Plan and associated Programme of Measures, which should be incorporated into the Plan.

- You are referred to the EU's Common Implementation Strategy for the Water Framework Directive (2000/60/EC) – Guidance Document No. 20, in particular Section 3.5 Key Issues for Article 4.7. Provisions should be included in the Plan to ensure that any proposed land use zoning or development associated with the Plan is not in breach of the requirements of the Water Framework Directive. The guidance document can be found at:

http://circa.europa.eu/Public/irc/env/wfd/library?l=/framework_directive/guidance_documents/documentn20_mars09pdf/_EN_1.0_&a=d

- It is noted that the OPW have identified recurring flood events within the Plan area. It should be ensured that a preliminary flood risk assessment is carried out in accordance with the Flood Risk Management Guidelines (DEHLG/OPW, 2009). Zoning and development of lands within the Plan area should take into account the risk of flooding.

- You are referred to the Shannon CFRAMS, which is currently undergoing SEA. The findings of the Shannon CFRAMS should be incorporated into future versions of the Plan when finalised.

- Consideration should also be given to including policies/objectives in the Plan, promoting the development of green infrastructure and SUDS measures. In this context, your attention is brought to the recent European Environment Agency guidance on Green Infrastructure which can be found at http://www.eea.europa.eu/publications/green-infrastructure-and-territorial-cohesion

- The Pollution Reduction Programmes and associated Characterisation Reports for any designated Shellfish Waters within the zone of influence of the Plan area should be taken into account in the SEA and the policies and objectives of the Plan.

- It should be ensured that the adjacent SACs, SPAs and pNHAs are protected, including in particular the Lower River Shannon SAC, Barrigone SAC/pNHA, River Shannon & River Fergus SPA, Inner Shannon Estuary South Shore pNHA and Sturamus Island pNHA. The potential for cumulative/in-combination effects on Natura 2000 sites within the zone of influence of the Plan should be assessed. It should be ensured that Appropriate Assessment screening is carried out in consultation with the National Parks and Wildlife Service.

- The potential for cumulative/in –combination effects resulting from this Plan and other relevant on-going Plans and Programmes within and adjacent to the Plan area should also be assessed.

- It should be ensured that adequate and appropriate drinking water and waste water treatment infrastructure and capacity are in place prior to development within the Plan area.

Further comment will be provided by the Agency upon receipt of the Draft Environmental Report and Plan and associated documents during the next statutory consultation phase of the SEA Process.

Updated SEA Regulations / Circular

Your attention is brought to the new SEA Regulations, which should be referenced and integrated into the Plan and SEA process.

Two amending SEA Regulations were signed into Irish law on 3rd May 2011, amending the original SEA Regulations:

a.. European Communities (Environmental Assessment of Certain Plans and Programmes) (Amendment) Regulations 2011, (S.I. No. 200 of 2011), amending the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (S.I. No. 435 of 2004), and

a.. Planning and Development (Strategic Environmental Assessment) (Amendment) Regulations 2011, (S.I. No. 201 of 2011), amending the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (S.I. No. 436 of 2004).

You are also referred to the recent DoECLG Circular (PSSP 6/2011) issued on the 26th July 2011 to each County/City Manager, Director of Services and Town Clerk in relation to 'Further Transposition of the EU Directive 2001/42/EC on Strategic Environmental Assessment (SEA)' which should also be referred to and integrated into the Masterplan.

European Communities (Birds and Natural Habitats) Regulations 2011

You are also referred to the requirements of the recent European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011), which should be taken into account in implementing the Plan. These Regulations consolidate the European Communities (Natural Habitats) Regulations 1997 to 2005 and the European Communities (Birds and Natural Habitats) (Control of Recreational Activities) Regulations 2010, as well as addressing transposition failures identified in the CJEU judgements.

Environmental Authorities

You are reminded of the requirement, where appropriate under the SEA Regulations, and as amended by S.I. No. 201 of 2011, to give notice to the following:

a.. The Environmental Protection Agency

a.. The Minister for the Environment, Community & Local Government

a.. Minister for Agriculture, Marine and Food, and the Minister for Communications Energy and Natural Resources, where it appears to the planning authority that the plan or programme, or modification of the plan or programme, might have significant effects on fisheries or the marine environment

a.. where it appears to the competent authority that the plan or programme, or amendment to a plan or programme, might have significant effects in relation to the architectural heritage or to nature conservation, the Minister for Arts, Heritage and Gaeltacht Affairs

a.. any adjoining planning authority whose area is continuous to the area of a planning authority which prepared a draft plan, proposed variation or local area plan.

You are further reminded that a copy of your decision regarding the determination should be made available for public inspection at your offices, local authority website and should also be notified to any Environmental Authorities already consulted.

Should you have any queries or require further information in relation to the above please contact the Ms Nicola Foley at foleyni@epa.ie. I would be grateful if an acknowledgement of receipt of this submission could be sent electronically to the following address: sea@epa.ie.

Yours Sincerely,

_____

Tadhg O'Mahony

Senior Scientific Officer

SEA Section - Environmental Research Centre

Office of Environmental Assessment

Environmental Protection Agency

Regional Inspectorate

Inniscarra, County Cork

An Roinn
Ealaíon, Oidhreachta agus Gaeltachta
Department of
Arts, Heritage and the Gaeltacht

10th August 2012

Your Ref: **IBE0TBC**
Our Ref: **DAU-2012-LI-CON- G Pre00317/2012**

Sheila Downes,
RPS Consulting Engineers,
Mulkear House,
Newtown Centre,
Annacotty,
Co. Limerick

Re: SEA screening determination and initial scoping for Vision 2041 (Masterplan)

A Chara,

I refer to your recent correspondence. Outlined below are the underwater archaeological observations with respect to the above-proposed development application.

Any EIS or EIA that shall be done for this should included a detailed underwater archaeological assessment section, undertaken by a suitably qualified archaeologist (combining where required terrestrial, foreshore and underwater assessment) and shall be carried out under licence to this Department.

Architectural heritage, terrestrial archaeological and nature conservation observations, if any, will follow in due course.

Kindly forward any further information to the following address:

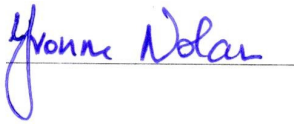
The Manager,
Development Applications Unit,
Department of Arts, Heritage and the Gaeltacht,
Newtown Road,
Wexford

Alternatively, documentation associated with the above can be referred electronically to the DAU at the following address:

manager.dau@ahg.gov.ie

Finally, the above observations and recommendations are based on the papers submitted to this Department on a pre-planning basis and are made without prejudice to any observations the Minister may make in the context of any consultation arising on foot of any development application referred to the Minister, by the planning authority, in his role as statutory consultee under the Planning and Development Act 2000, as amended.

Is mise le meas,



Yvonne Nolan,
Development Applications Unit
Tel: (053) 911 7382
E-mail: yvonne.nolan@ahg.gov.ie

The following Guidance / Methodology documents will be referred to during the SEA process:

Development of Strategic Environmental Assessment (SEA) Methodologies for Plans and Programmes in Ireland. Synthesis Report. 2003. Environmental Protection Agency.
http://www.epa.ie/downloads/advice/ea/name,13547,en.html

GISEA Manual – Consultation Draft. January 2010. Environmental Protection Agency.
http://www.epa.ie/downloads/consultation/Updated%20Jan%202010%20Draft_GISEAManual.pdf

Implementation of SEA Directive (2001/42/EC). Assessment of Certain Plans and Programmes on the Environment. Guidelines for Regional Planning Authorities. November 2004. Department of Environment, Heritage and Local Government.
http://www.environ.ie/en/Publications/DevelopmentandHousing/Planning/FileDownLoad,1616,en.pdf

Strategic Environmental Assessment (SEA) Checklist - Consultation Draft. January 2008. Environmental Protection Agency.
http://www.epa.ie/downloads/consultation/strategic_environmental_assessment_jan086.pdf

Guidelines on SEA. Department of Communications, Energy and Natural Resources. Available at:
http://www.dcmnr.gov.ie/Marine/Environmental+Assessment/Environmental+Assessment.htm

Northern Ireland

A Practical Guide to the Strategic Environmental Assessment Directive. September 2005. Office of the Deputy Prime Minister.
http://www.ehsni.gov.uk/bm_sea_practicalguide.pdf

Strategic Environmental Assessment. Services and Standards for Responsible Authorities. Environment and Heritage Service.
http://www.ehsni.gov.uk/sea-servicesandstandards.pdf

Strategic Environmental Assessment DRAFT Practical Guidance for Practitioners on How to Take Account of Air. June 2008. Scotland & Northern Ireland Forum for Environmental Research.

Strategic Environmental Assessment DRAFT Practical Guidance for Practitioners on How to Take Account of Soil. June 2008. Scotland & Northern Ireland Forum for Environmental Research.

Strategic Environmental Assessment DRAFT Practical Guidance for Practitioners on How to Take Account of Water. June 2008. Scotland & Northern Ireland Forum for Environmental Research.

Strategic Environmental Assessment and Biodiversity: Guidance for Practitioners. June 2004. Countryside Council for Wales, English Nature, the Environment Agency and the RSPB.
http://www.english-nature.org.uk/pubs/publication/PDF/SEAbiodiversityGuide.pdf

Strategic Environmental Assessment Toolkit (Version 1). September 2006. Scottish Executive.
http://www.scotland.gov.uk/Publications/2006/09/13104943/0

Strategic Environmental Assessment Website. Guidance on Air, Soil and Water. September 2009. SNIFFER.
http://www.seaguidance.org.uk/1/Homepage.aspx

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