

## 11 FLORA AND FAUNA

### 11.1 Introduction

This section describes the existing flora and fauna of the proposed pipeline corridor. This section also examines the various elements of both the construction and operational phases which have the potential to impact on flora and fauna. The likely significant impacts for both construction and operation of the proposed scheme prior to mitigation are described. The mitigation measures are described in Section 11.6 and the residual impacts after the proposed mitigation measures have been implemented are described in Section 11.7.1.

### 11.2 Study Area

The ecological appraisal included the following elements:

- Description of the ecology of the existing environment along the proposed pipeline corridor through a combination of field surveys and desktop review of available ecological data
- Review of designated conservation areas within a 10 km radius of the proposed pipeline corridor.

### 11.3 Methodology

#### 11.3.1 Consultation

The full consultation and scoping process that was carried out in order to identify key impacts from the proposed development is described in Chapter 5 of the EIS.

The comments received from various consultees in relation to nature conservation and ecology are summarised in Table 11.1, with a copy of all correspondence received included in Appendix 5.2 of Volume 3 of the EIS.

**Table 11.1: Consultation Responses in Relation to Nature Conservation & Ecology**

Consultee	Date of Response	Comments
Department of Arts, Heritage & the Gaeltacht – Development Applications Unit (DAU)	28/05/2014	<p>A comprehensive response was received from the Development Applications Unit. The main points raised were:</p> <ul style="list-style-type: none"> <li>• An ecological survey should be carried out of the proposed compound sites and route of the pipeline to survey the habitats and species present.</li> <li>• Inland Fisheries Ireland should be consulted with regard to fish.</li> <li>• Existing records from the NPWS and Biodiversity Data Centre should be checked and reference made to various Biodiversity Plans.</li> <li>• EIS should address alien invasive species.</li> <li>• It may be necessary to obtain hydrological and/or geological data to assess impact on water table levels or groundwater flows.</li> <li>• EIS should assess cumulative impacts with other plans or projects.</li> <li>• If impacts on protected species and habitats are identified, then licences may be required.</li> <li>• Pre-construction ecology survey of site is recommended if development takes place well after original baseline surveys were carried out.</li> <li>• Appropriate Assessment of the development should be carried out following the relevant guidance documents.</li> </ul>

Consultee	Date of Response	Comments
Department of Agriculture, Fisheries & Food	20/09/2011  22/09/2011  14/10/2011	Aquaculture and Foreshore Management Division have no comments to make on consultation letter  Proposal has been appraised and observations on this appraisal will be forwarded once completed  This submission outlined a number of observations & recommendations: <ul style="list-style-type: none"> <li>• Assess the impact if any on agriculture/agricultural activities north of Dublin City</li> <li>• Impacts on water supplies (quality) during construction phase and leakage thereafter</li> <li>• Safety impacts</li> </ul>
Inland Fisheries Board	03/02/2011 Received 11/10/11  12/05/14	This submission outlined a number of observations & requirements that were outlined as part of earlier consultation for the proposed scheme on 03/02/2011: <ul style="list-style-type: none"> <li>• The ecological integrity of the water systems must be maintained at all times</li> <li>• Measures should be taken to ensure comprehensive protection of the water bodies particularly at river and stream crossings taking cognisance of the "<i>Requirements for the protection of Fisheries Habitat during Construction and Development Works at River Sites</i>"</li> <li>• Maintaining habitat integrity (both in stream and riparian) is essential in safeguarding the ecological value of waterways.</li> <li>• Any works directly affecting watercourse or riparian habitats including trenchless technology in the area must be first submitted as a method statement to IFI Blackrock for assessment and approval</li> <li>• Control of sediment and pollutants during the construction phase and operation phases to ensure there is no impact on the surface water systems</li> <li>• The installation of pipelines must in no way impact negatively on the passage of salmonids</li> <li>• No in-stream works should be carried out without the written approval of IFI Blackrock</li> </ul>
Health Service Executive	May 2014	It is recommended that regular water quality monitoring/sampling of any surface water bodies, water courses, streams, ditches and groundwater be carried out during construction and operational phases of the proposed development. Detailed mitigation measures should be identified during the Environmental Impact Assessment including visual leak detection in relevant and vulnerable areas of water bodies/courses and pipeline equipment. It is recommended that extra physical protection of pipes be provided at all river and stream crossings including the Tolka, Santry, Mayne, Wad, Naniken Rivers and the Cuckoo and Kilbarrack Streams which will require specialised construction techniques.  Chemical and quantitative analysis of the Dublin Urban Waterbody should be regularly monitored against ELVs.  The pipeline route also lies adjacent to the South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay pNHA, Santry Demesne pNHA and Royal Canal pNHA.

### 11.3.2 Designated Sites

A desktop study was carried out to identify the designated nature conservation sites such as candidate Special Areas of Conservation (cSACs) and SACs, candidate Special Protection Areas (cSPAs) and SPAs, Natural Heritage Areas (NHAs), and proposed Natural Heritage Areas (pNHAs) located within 10 km of the proposed pipeline corridor. FTC holds an archive of GIS data that includes the location and extent of all designated conservation areas. These were plotted on an OSI background map using MapInfo Professional (v 10.5) GIS application. Information on the designated sites was obtained from the National Parks and Wildlife Service (NPWS) website.

The EU Habitats Directive (92/43/EEC) on the Conservation of Natural Habitats and of Wild Fauna and Flora, formed a basis for the designation of SACs. Similarly, SPAs are legislated for under the Birds Directive (Council Directive 79/409/EEC on the Conservation of Wild Birds). Collectively, SACs and SPAs are referred to as European or Natura 2000 sites. In general terms, they are considered to be of exceptional importance in terms of rare, endangered or vulnerable habitats and species within the European Community.

NHAs are sites that are legally protected in Ireland under the Irish Wildlife Acts (1976–2012). Proposed NHAs, or pNHAs, have not been statutorily designated in Ireland but are still subject to limited protection in Ireland. As they are of significance for wildlife and habitats, the ecological value of pNHAs must be recognised in planning applications.

The designated nature conservation sites located within 10 km of the proposed pipeline route are outlined in Section 11.4.1. In accordance with Article 6(3) and 6 (4) the EU Habitats Directive, a Natura Impact Statement (NIS) has been completed for the proposed development, in order to assess the potential impacts on the Natura 2000 sites. The NIS is being submitted with the accompanying planning application.

### 11.3.3 Desktop Review

A desktop study was undertaken to locate any records of rare or protected flora and fauna that have previously been recorded for the pipeline corridor and surrounding area. A list of plant species that have been previously recorded from the 10 km grid squares O13 and O14 was generated from the New Atlas of British and Irish Flora (Preston *et al.*, 2002). This list was cross referenced to the list of plant species that are protected under the Flora (Protection) Order, 1999 S.I. No. 94/1999 and listed in the Irish Red Data Book 1 Vascular Plants (Curtis & McGough, 1988).

Records available on the National Parks and Wildlife Service (NPWS) and the National Biodiversity Data Centre websites were reviewed. Other data sources include Ireland's Wetlands and their Waterbirds: Status and Distribution (Crowe, 2005), the Flora of County Dublin (Doogue, 1998), the Atlas of Wintering Birds in Britain and Ireland (Lack, 1986) and the Atlas of Breeding Birds in Britain and Ireland (Sharrock, 1976). Dublin City Council documents, 'Dublin City Biodiversity Action Plan 2008 – 2012' and 'A Management Plan for North Bull Island' along with Fingal County Council's 'Fingal Biodiversity Action Plan 2010-2015' were also reviewed.

Data on the wildfowl using Dublin Bay from Irish Wetland Bird Survey (I-WeBS) counts was obtained from BirdWatch Ireland.

### 11.3.4 Habitats and Botanical Survey

With the aid of large scale strip maps (scale 1:1000), ortho-photographs and a handheld GPS unit, (Garmin GPSMAP 60CSx) the proposed pipeline corridor was assessed through a series of route walkover surveys on 31 January and 1 February 2011, 20 and 21 September 2011, 1 October 2013 and 06 March 2015. The major habitats occurring along the route were classified according to Fossitt's (2000) habitat classification guidelines.

A list of botanical species encountered along the pipeline corridor during the walkover survey was compiled. Particular note of any rare or protected species was taken, including an assessment as to the suitability of the habitats present to support any of the rare or protected plants identified in the desktop survey. Notes of any mature trees occurring directly within the pipeline corridor were recorded. Records of invasive species located along the pipeline corridor were taken.

Habitats were assessed and evaluated according to their occurrence as protected habitats under Annex I of the EU Habitats Directive (92/43/EEC) and for their capacity to support rare, threatened and endangered

species. Botanical species were assessed in accordance with their occurrence on the Flora (Protection) Order 1999, S.I. 94/1999 and The Irish Red Data Book (Curtis & McGough, 1988). The ecological evaluation assessment for habitats used in this study is based on Nairn and Fossitt (2004) and the full evaluation system is given in Appendix 11.1 of Volume 3 of the EIS.

The main habitats and botanical species identified are outlined in Section 11.4.3.

### 11.3.5 Terrestrial Mammals and Bats

The proposed pipeline route corridor (or sections of it) was surveyed for mammals during the route walkover surveys on 31 January and 1 February 2011, 20 and 21 September 2011 and on 1 October 2013. Any tracks or signs (including droppings, resting places, burrows and setts) of mammals occurring along the proposed pipeline corridor were recorded as field notes and on large scale maps (1:5000). Positions of important sightings were recorded using GPS. In addition, any direct sightings of mammals made during the walkover were recorded on the field survey maps.

Mammal signs, such as dwellings, feeding traces, tracks or droppings indicate their presence on site with occasional direct observations also made. The methods used to identify the presence of mammals in the survey area followed international best practice (Lawrence & Brown, 1973; Clark, 1988; Smal, 1995; Sargent & Morris, 2003; Bang & Dahlstrom, 2004; JNCC, 2004).

The suitability of habitats and vegetation that occur adjacent to the pipeline corridor was assessed to determine whether any potential roosting, feeding or commuting sites could be present along the route.

### 11.3.6 Bird Surveys

#### *Winter Bird Survey for Light-bellied Brent Goose*

The southern end of the proposed pipeline corridor will run along the Alfie Byrne Road which is situated between the Tolka Estuary and the Alfie Byrne Open Space. This amenity area is adjacent to the River Tolka Estuary north of the River Liffey which is protected as part of the South Dublin Bay and River Tolka Estuary SPA, which holds internationally important numbers of over-wintering Light-bellied Brent Goose (hereinafter referred to as Brent or Brent Goose). Indeed Brent are a qualifying interest of the SPA. It should be noted that the proposed pipeline corridor is not located within the SPA. Further north along the proposed route the pipeline corridor runs along the Malahide road (R139) which lies adjacent to Belcamp and Darndale Parks. The Tolka Estuary, Belcamp and Darndale Parks also provide important grazing for Brent each season. Dublin Bay is the most important site for Brent in the Republic of Ireland providing reliable access to food, fresh water and a safe roosting location (Porter, 2014 unpublished report). An increase in numbers of Brent visiting Dublin is thought to have put pressure on estuarine resources and forced the birds inland to feed (Ní Lamhna *et al.*, 2012).

Brent Geese are listed on Annex I of the EU Birds Directive (2009/147/EC). They are currently amber-listed in Ireland (Colhoun & Cummins, 2013) as the majority winter at less than ten sites. The Irish population is also internationally significant, another amber-listing criterion (BirdWatch Ireland).

To assess the importance of the River Tolka Inner Estuary and the Alfie Byrne Open Space (alongside the Tolka Estuary) and Belcamp Park for Brent, a dedicated winter bird survey of both areas was carried out by Contact Nature from November 2013 to March 2014. While the survey focussed on the presence of Brent in both areas, waterbirds and gulls were also recorded.

The full Brent Goose survey report including methods and results is available in Appendix 11.2 of Volume 3 of the EIS. The survey was carried out by means of two fixed Vantage Points (VP) on one date per month from November 2013 to March 2014. One surveyor observed and monitored birds on the River Tolka Inner Estuary and the Alfie Byrne Road Open Space, and a second surveyor concurrently observed birds at Belcamp Park. Figure 11.4 shows the locations of the VPs and the grasslands monitored.

Counts were done simultaneously to ensure no double counting of Brent by observers. The survey period at both sites started at either the exact low water time or high water time, using Dublin Docks datum, and varied over the five visits where practicable due to weather and observer availability.

All Brent, waterbird and gull species observable were counted hourly (River Tolka Inner Estuary and the Alfie Byrne Road Open Space) or half hourly (Belcamp Park) for a six hour period at each VP location, and all flightlines recorded. Numbers of all other bird species were counted on the River Tolka Inner Estuary.

#### *Other Birds Along Pipeline Corridor*

Bird species observed during the walkover surveys on 31<sup>st</sup> January and 1<sup>st</sup> February 2011, 20<sup>th</sup> and 21<sup>st</sup> September 2011 and on 1<sup>st</sup> October 2013 were recorded. Although the walkover surveys were carried out outside of the bird breeding season each year, the results are representative of the birds typically present in this urban environment.

The conservation status of the species found on the route was also assessed. BirdWatch Ireland and the Royal Society for the Protection of Birds (RSPB Northern Ireland) have agreed a list of priority bird species for conservation action in the whole of Ireland (Colhoun & Cummins, 2013). This *Birds of Conservation Concern in Ireland* is published in a list known as the BoCCI List. In this BoCCI List, birds are classified into three separate lists (Red, Amber and Green), based on the conservation status of the bird and hence conservation priority.

Red-listed species are of highest conservation concern and Amber-listed species are of medium conservation concern; Green-listed species are considered of no particular conservation concern.

#### 11.3.7 Aquatic Ecology and Freshwater Fish

A desktop study of the value of the rivers crossed by the proposed pipeline corridor in terms of fisheries was carried out using data available from the NPWS and IFI, and through consultation with both bodies. The presence of any other species, e.g. macroinvertebrates or amphibians, encountered during the site walkover was also recorded. Special note was taken of the habitats in which these species were observed.

A desktop study on the biological water quality of the rivers crossed by the pipeline route corridor was carried out using Q-value ratings obtained by the EPA at various sampling locations along these rivers, between 2003 and 2007 (<http://gis.epa.ie/Envision>). The EPA uses the Q-value (Quality Rating System) to assess water quality in Irish rivers through the assessment of macroinvertebrates, aquatic macrophytes, phytobenthos and hydromorphology. It is used to provide a rapid assessment of water quality in rivers and streams and to provide links with chemical status and land-use pressures. The Q-value scores range from 1 to 5. High ecological quality is indicated by Q5 and Q4–5 while Q1 indicates bad quality.

Surface Water Quality and Drainage are also discussed in further detail in Chapter 13 of the EIS.

## **11.4 Ecology in the Existing Environment**

### 11.4.1 Designated Sites

The proposed pipeline route corridor does not lie within any designated nature conservation site. There are a total of 34 designated sites lying within a 10 km radius of the pipeline corridor. These 34 sites consist of seven SPAs, eight cSACs<sup>12</sup> and 18 pNHAs. These sites are listed below and a brief summary of each is provided in Table 11.2. Seven of the pNHAs are also designated as Natura 2000 sites. The location of the proposed pipeline corridor in relation to the Natura 2000 sites within 10 km is shown on Figure 11.1.

The location of the pipeline corridor in relation to the pNHAs within 10 km is shown on Figure 11.2. There are no NHAs within a 10 km radius of the proposed pipeline corridor.

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<sup>12</sup> At present all SACs in Ireland are 'candidate' SACs, and referred to as cSACs. The relevant Statutory Instruments for the SACs in Ireland have not yet been put in place, though these sites must still be afforded protection in accordance with the EU Habitats Directive (92/43/EEC).

The seven SPAs are:

- South Dublin Bay and River Tolka Estuary (site code 004024)
- North Bull Island (site code 004006)
- Malahide Estuary SPA (site code 004025)
- Baldoyle Bay (site code 004016)
- Rogerstown Estuary (site code 004015)
- Ireland's Eye (site code 004117)
- Howth Head Coast (004113)

The eight cSACs are:

- North Dublin Bay (site code 000206)
- South Dublin Bay (site code 000210)
- Malahide Estuary (site code 000205)
- Baldoyle Bay (site code 000199)
- Howth Head (site code 000202)
- Rogerstown Estuary (site code 000208)
- Ireland's Eye (site code 002193)
- Rockabill to Dalkey Island (site code 3000)

The 19 pNHAs are:

- North Dublin Bay (site code 000206)
- Royal Canal (site code 002103)
- Grand Canal (site code 002104)
- Santry Demesne (site code 000178)
- Dublin Docks (site code 000201)
- South Dublin Bay (site code 000210)
- Feltrim Hill (site code 001208)
- Sluice River Marsh (site code 001763)
- Malahide Estuary (site code 000205)
- Booterstown Marsh (site code 001205)
- Baldoyle Bay (site 000199)
- Howth Head (site code 000202)
- Liffey Valley (site code 000128)
- Rogerstown Estuary (site code 000208)
- Dalkey Coastal Zone and Killiney Hill (site code 001206)
- Portraine Shore (site code 001215)
- Fitzsimon's Wood (site code 001753)
- Ireland's Eye (site code 000203)
- Dodder Valley (site code 000991)

The proposed pipeline corridor lies adjacent to the South Dublin Bay and River Tolka Estuary SPA and North Dublin Bay pNHA (see Figures 11.1 and 11.2). South Dublin Bay and River Tolka Estuary SPA has been designated as it supports internationally important populations of Brent Geese. It is a large site (1,700 ha) that comprises a substantial part of Dublin Bay including the Tolka River estuary. The North Dublin Bay pNHA lies partly within the boundaries of the South Dublin Bay and River Tolka Estuary SPA.

North Bull Island is the main focus of this pNHA but the bay itself is included in the designation because of the large numbers of wildfowl (again including Light-bellied Brent Geese) that occur within the bay. Both the South Dublin Bay and River Tolka Estuary SPA and the North Dublin Bay pNHA are located towards the southern end of the pipeline corridor.

The full site synopses for all of the designated sites are given in Appendix 11.3 of Volume 3 of the EIS, with the exception of Feltrim Hill pNHA for which a site synopsis is not available.

**Table 11.1: Summary of the Designated Nature Conservation Sites within 10 km of the Proposed Pipeline Route**

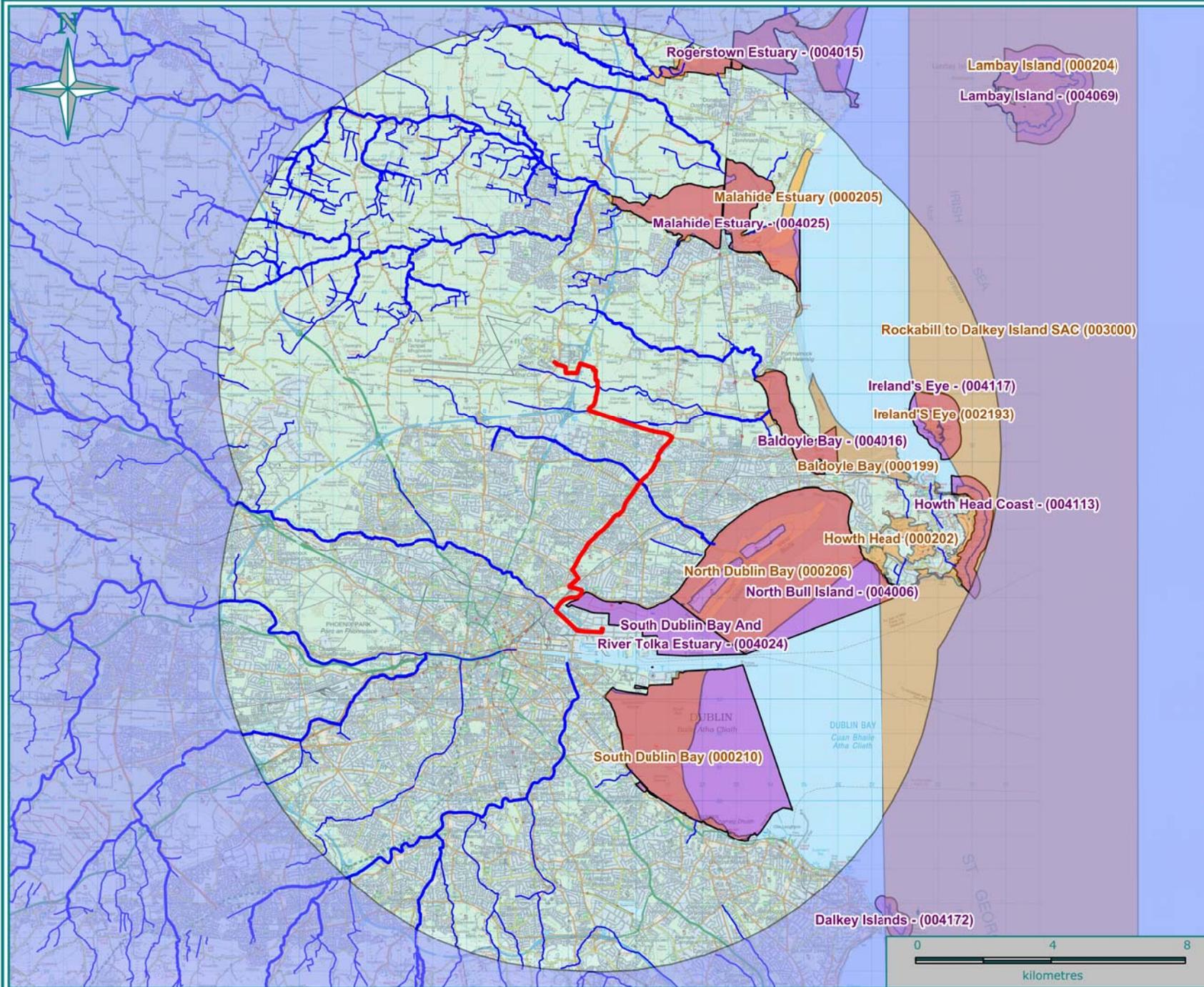
Designated Site	Site Code	Reason for designation	Distance from Pipeline (km)
North Dublin Bay cSAC and pNHA	000206	<p>This site is an excellent example of a coastal site with all the main habitats represented. The site holds good examples of ten habitats that are listed on Annex I of the E.U. Habitats Directive; one of these is listed with priority status. Several of the wintering bird species have populations of international importance, while some of the invertebrates are of national importance. The site contains a numbers of rare and scarce plants including some which are legally protected.</p> <p><b>Qualifying features of cSAC:</b></p> <p>Mudflats and sandflats not covered by seawater at low tide [1140], Annual vegetation of drift lines [1210], Salicornia and other annuals colonizing mud and sand [1310], <i>Spartina</i> swards (<i>Spartinion maritimae</i>) [1320], Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1330], Petalwort (<i>Petalophyllum ralfsii</i>) [1395], Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410], Embryonic shifting dunes [2110], Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120], Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130], Humid dune slacks [2190].</p>	<b>0.02 (pNHA boundary) 2.6 (cSAC boundary)</b>
South Dublin Bay and River Tolka Estuary SPA	004024	<p>The South Dublin Bay and River Tolka Estuary SPA is of international importance for Light-bellied Brent Geese and of national importance for nine other waterfowl species. As an autumn tern roost, it is also of international importance. Furthermore, the site supports a nationally important colony of Common Tern. All of the tern species using the site are listed on Annex I of the E.U. Birds Directive, as are Bar-tailed Godwit and Mediterranean Gull.</p> <p><b>Qualifying features of SPA:</b></p> <p>Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046], Oystercatcher (<i>Haematopus ostralegus</i>) [A130], Ringed Plover (<i>Charadrius hiaticula</i>) [A137], Grey Plover (<i>Pluvialis squatarola</i>) [A140], Knot (<i>Calidris canutus</i>) [A143], Sanderling (<i>Calidris alba</i>) [A144], Dunlin (<i>Calidris alpina</i>) [A149], Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157], Redshank (<i>Tringa totanus</i>) [A162], Black-headed Gull (<i>Croicocephalus ridibundus</i>) [A179], Roseate Tern (<i>Sterna dougallii</i>) [A192], Common Tern (<i>Sterna hirundo</i>) [A193], Arctic Tern (<i>Sterna paradisaea</i>) [A194], Wetlands &amp; Waterbirds [A999].</p>	<b>0.04</b>
Royal Canal pNHA	002103	The ecological value of the canal lies more in the diversity of species it supports along its linear habitats than in the presence of rare species. It crosses through agricultural land and therefore provides a refuge for species threatened by modern farming methods.	<b>0.59</b>
Grand Canal pNHA	002104	The ecological value of the canal lies more in the diversity of species it supports along its linear habitats than in the presence of rare species. It crosses through agricultural land and therefore provides a refuge for species threatened by modern farming methods.	<b>1.06</b>
Santry Demesne pNHA	000178	The primary importance of this site is that it contains a legally protected plant species. The woodland, however, is of general ecological interest as it occurs in an area where little has survived of the original vegetation	<b>1.7</b>

Designated Site	Site Code	Reason for designation	Distance from Pipeline (km)
Dolphins, Dublin Docks pNHA	000201	This site is an important Tern colony, especially for Arctic Tern which is a scarce nester on the east coast	1.8
South Dublin Bay cSAC and pNHA	000210	This site lies south of the River Liffey and extends from the South Wall to the west pier at Dun Laoghaire. It is an intertidal site with extensive areas of sand and mudflats, a habitat listed on Annex I of the E.U. Habitats Directive. South Dublin Bay is also an internationally important bird site. Although birds regularly commute between the south bay and the north bay, recent studies have shown that certain populations which occur in the south bay spend most of their time there.  <b>Qualifying features of cSAC:</b> The mudflats and sandflats habitats which are exposed at low tide [1140]	1.69
Feltrim Hill pNHA	001208	Site synopsis not available	1.9
North Bull Island SPA	004006	The North Bull Island SPA is an excellent example of an estuarine complex and is one of the top sites in Ireland for wintering waterfowl. It is of international importance on account of both the total number of waterfowl and the individual populations of Pale-bellied Brent Goose, Black-tailed Godwit and Bar-tailed Godwit that use it. Also of significance is the regular presence of several species that are listed on Annex I of the E.U. Birds Directive, notably Golden Plover and Bar-tailed Godwit, but also Ruff and Short-eared Owl.  <b>Qualifying features of SPA:</b> Light-bellied Brent Goose ( <i>Branta bernicla hrota</i> ) [A046], Shelduck ( <i>Tadorna tadorna</i> ) [A048], Teal ( <i>Anas crecca</i> ) [A052], Pintail ( <i>Anas acuta</i> ) [A054], Shoveler ( <i>Anas clypeata</i> ) [A056], Oystercatcher ( <i>Haematopus ostralegus</i> ) [A130], Golden Plover ( <i>Pluvialis apricaria</i> ) [A140], Grey Plover ( <i>Pluvialis squatarola</i> ) [A141], Knot ( <i>Calidris canutus</i> ) [A143], Sanderling ( <i>Calidris alba</i> ) [A144], Dunlin ( <i>Calidris alpina</i> ) [A149], Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156], Bar-tailed Godwit ( <i>Limosa lapponica</i> ) [A157], Curlew ( <i>Numenius arquata</i> ) [A160], Redshank ( <i>Tringa totanus</i> ) [A162], Turnstone ( <i>Arenaria interpres</i> ) [A169], Black-headed Gull ( <i>Larus ridibundus</i> ) [A179], Wetlands & Waterbirds [A999]	2.7
Sluice River Marsh pNHA	001763	This site is of importance as a relatively intact freshwater marsh, a habitat that is now rare in County Dublin	2.8
Malahide Estuary SPA	004025	The site is of high conservation importance, with an internationally important population of Brent Goose and nationally important populations of a further 12 species. Three of the species which occur regularly (Golden Plover, Bar-tailed Godwit and Ruff) are listed on Annex I of the E.U. Birds Directive.  <b>Qualifying features of SPA:</b> Great Crested Grebe ( <i>Podiceps cristatus</i> ) [A005], Light-bellied Brent Goose ( <i>Branta bernicla hrota</i> ) [A046], Shelduck ( <i>Tadorna tadorna</i> ) [A048], Pintail ( <i>Anas acuta</i> ) [A054], Goldeneye ( <i>Bucephala clangula</i> ) [A067], Red-breasted Merganser ( <i>Mergus serrator</i> ) [A069], Oystercatcher ( <i>Haematopus ostralegus</i> ) [A130], Golden Plover ( <i>Pluvialis apricaria</i> ) [A140], Grey Plover ( <i>Pluvialis squatarola</i> ) [A141], Knot ( <i>Calidris canutus</i> ) [A143], Dunlin ( <i>Calidris alpina</i> ) [A149], Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156], Bar-tailed Godwit ( <i>Limosa lapponica</i> ) [A157], Redshank ( <i>Tringa totanus</i> ) [A162], Wetlands & Waterbirds [A999].	4.3

Designated Site	Site Code	Reason for designation	Distance from Pipeline (km)
Malahide Estuary cSAC and pNHA	000205	<p>This site is a fine example of an estuarine system with all the main habitats represented. The estuary is an important wintering bird site and holds an internationally important population of Brent Geese and nationally important populations of a further 15 species.</p> <p><b>Qualifying features of cSAC:</b></p> <p>Mudflats and sandflats not covered by seawater at low tide [1140], Salicornia and other annuals colonizing mud and sand [1310], Spartina swards (<i>Spartinion maritimae</i>) [1320], Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1330], Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410], Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120], Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]</p>	4.3
Boosterstown Marsh pNHA	001205	<p>Boosterstown Marsh is the only saltmarsh in south Dublin and, despite some concerns about the increasing salinity of the site, it remains a valuable habitat for many birds as well as containing a diverse flora including the protected plant Borrer's Saltmarsh-grass (<i>Puccinellia fasciculata</i>).</p>	4.5
Baldoyle Bay SPA	004016	<p>Baldoyle Bay SPA is of high conservation importance, with an internationally important population of Brent Geese and nationally important populations of a further seven species, including two which are listed on Annex I of the E.U. Birds Directive. Baldoyle Bay is of high ornithological importance for wintering waterfowl, providing good quality feeding areas and roost sites for an excellent diversity of waterfowl species. The inner estuarine section is a Statutory Nature Reserve and is also designated as a wetland of international importance under the Ramsar Convention. The main threat to the birds is disturbance as it is located in a densely populated area.</p> <p><b>Qualifying features of SPA:</b></p> <p>Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046], Shelduck (<i>Tadorna tadorna</i>) [A048], Ringed Plover (<i>Charadrius hiaticula</i>) [A137], Golden Plover (<i>Pluvialis apricaria</i>) [A140], Grey Plover (<i>Pluvialis squatarola</i>) [A141], Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157], Wetlands &amp; Waterbirds [A999].</p>	2.9
Baldoyle Bay cSAC and pNHA	000199	<p>Baldoyle Bay is a tidal estuarine bay protected from the open sea by a large sand dune system. Two small rivers, the Mayne and the Sluice, flow into the bay. The site contains four habitats listed on Annex I of the EU Habitats directive: <i>Salicornia</i> mud, Mediterranean salt meadows, Atlantic salt meadows and Tidal mudflats. The site has two legally protected plant species and is also an important bird area and part of it is a Special Protection Area under the EU Birds Directive, as well as being a Statutory Nature Reserve.</p> <p><b>Qualifying features of cSAC:</b></p> <p>Mudflats and sandflats not covered by seawater at low tide [1140], Salicornia and other annuals colonizing mud and sand [1310], Spartina swards (<i>Spartinion maritimae</i>) [1320], Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1330], Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410].</p>	2.5

Designated Site	Site Code	Reason for designation	Distance from Pipeline (km)
Howth Head cSAC and pNHA	000202	Howth Head displays a fine range of natural habitats, including two Annex I habitats, within surprisingly close proximity to Dublin city. The site is also of scientific importance for its seabird colonies, invertebrates and lichens. It also supports populations of at least two legally protected plant species and several other scarce plants. <b>Qualifying features of cSAC:</b> Vegetated sea cliffs of the Atlantic and Baltic coasts [1230], European dry heaths [4030].	<b>6.8 (cSAC)</b> <b>6.8 (pNHA)</b>
Howth Head Coast SPA	004113	The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for Kittiwake. The populations of Kittiwake and Black Guillemot are of national importance, while the Razorbill, Guillemot and Fulmar populations are of regional importance. The cliffs also support a breeding pair of Peregrine Falcon, a species listed on Annex I of the E.U. Birds Directive. The site is easily accessible and has important amenity and educational value due to its proximity to Dublin City. <b>Qualifying Interests of SPA:</b> Kittiwake ( <i>Rissa tridactyla</i> ) [A188]	<b>8.3</b>
Liffey Valley pNHA	000128	The site is important because of the diversity of the habitats within the site, ranging from aquatic to terrestrial. A number of rare and threatened plant species have been recorded from the site.	<b>7.7</b>
Rogerstown Estuary SPA	004015	Rogerstown Estuary is an important link in the chain of estuaries on the east coast. It supports an internationally important population of Brent Goose and a further 14 species in numbers of national importance. Bird populations have been well monitored since the 1980s and the site is counted at monthly intervals each winter (September to March) as part of the Irish Wetland Bird Survey (I-WeBS). The site is a statutory Nature Reserve and a candidate Special Area of Conservation under the E.U. Habitats Directive. <b>Qualifying features of SPA:</b> Greylag Goose ( <i>Anser anser</i> ) [A043], Light-bellied Brent Goose ( <i>Branta bernicla hrota</i> ) [A046], Shelduck ( <i>Tadorna tadorna</i> ) [A048], Shoveler ( <i>Anas clypeata</i> ) [A056], Oystercatcher ( <i>Haematopus ostralegus</i> ) [A130], Ringed Plover ( <i>Charadrius hiaticula</i> ) [A137], Grey Plover ( <i>Pluvialis squatarola</i> ) [A141], Knot ( <i>Calidris canutus</i> ) [A143], Dunlin ( <i>Calidris alpina</i> ) [A149], Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156], Redshank ( <i>Tringa totanus</i> ) [A162], Wetlands & Waterbirds [A999].	<b>8.8</b>
Rogerstown Estuary cSAC and pNHA	000208	This site is a good example of an estuarine system, with all typical habitats represented, including several listed on Annex I of the EU Habitats Directive. Rogerstown is an internationally important waterfowl site and has been a breeding site for Little Terns. The presence within the site of three rare plant species adds to its importance. <b>Qualifying features of cSAC:</b> Estuaries [1130], Mudflats and sandflats not covered by seawater at low tide [1140], Salicornia and other annuals colonizing mud and sand [1310], Spartina swards ( <i>Spartinion maritimae</i> ) [1320], Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritimae</i> ) [1330], Mediterranean salt meadows ( <i>Juncetalia maritimi</i> )	<b>8.5</b>

Designated Site	Site Code	Reason for designation	Distance from Pipeline (km)
		[1410], Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120], Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130].	
Dalkey Coastal Zone and Killiney Hill pNHA	001206	This site represents a fine example of a coastal system with habitats ranging from the sub-littoral to coastal heath. The flora is well developed and includes some scarce species. The islands are important bird sites. The site also has geological importance	8.6
Portraine Shore pNHA	001215	This site is a good example of a rocky bedrock shore with a typical flora and fauna. The grassy vegetation above the shore adds habitat diversity. The site is also an important geological site	9.0
Fitzsimon's Wood pNHA	001753	Fitzsimons Wood is a proposed Natural Heritage Area (pNHA), as it is a good example of semi-natural woodland. Fitzsimons Wood is also important for the presence of the Smooth Newt	9.2
Ireland's Eye SPA	004117	This relatively small island is of high ornithological importance, with seven seabird species having populations of national importance - Gannet, Cormorant, Herring Gull, Great Black-backed Gull, Kittiwake, Guillemot and Razorbill. The regular presence of a breeding pair of Peregrine Falcon is also of note. This species is listed on Annex I of the EU Birds Directive. <b>Qualifying features of SPA:</b> Cormorant ( <i>Phalacrocorax carbo</i> ) [A017], Herring Gull ( <i>Larus argentatus</i> ) [A184], Kittiwake ( <i>Rissa tridactyla</i> ) [A188], Guillemot ( <i>Uria aalge</i> ) [A199], Razorbill ( <i>Alca torda</i> ) [A200].	7.0
Ireland's Eye cSAC and pNHA	002193	This uninhabited marine island has a well-developed maritime flora, with two habitats (sea cliffs and shingle) listed on Annex II of the EU Habitats Directive, and nationally important seabird colonies. Owing to its easy access and proximity to Dublin it has great educational and amenity value. This relatively small island is of high ornithological importance, with seven seabird species having populations of national importance. <b>Qualifying features of cSAC:</b> Perennial vegetation of stony banks [1220], Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	7.3
Rockabill to Dalkey Island cSAC	(003000)	This site includes a range of dynamic inshore and coastal waters in the western Irish Sea. These include sandy and muddy seabed, reefs, sandbanks and islands. This site extends southwards, in a strip approximately 7 km wide and 40 km in length, from Rockabill, running adjacent to Howth Head, and crosses Dublin Bay to Frazer Bank in south county Dublin. The site encompasses Dalkey, Muglins and Rockabill islands. This site is of conservation importance for reefs, listed on Annex I, and Harbour Porpoise, listed on Annex II, of the E.U. Habitats Directive. <b>Qualifying features of cSAC:</b> Reefs [1170], Harbour porpoise ( <i>Phocoena phocoena</i> ) [1351]	7.3
Dodder Valley pNHA	000991	This site represents the last remaining stretch of natural river bank vegetation along the Dodder River which flows through the built up area of Greater Dublin.	9.95



**Legend**

- Proposed Pipeline Route
- Rivers
- Special Areas of Conservation (SAC)
- Special Protection Areas (SPA)

Date	11/03/2015
Name of Client	Finglebn White
Name of Job	EIS for Aviation Fuel Pipeline between Dublin Port - Dublin Airport
Title of Figure	Designated Sites - Natura 2000 Sites
Scales Used	1 : 160,000 @ A4
Figure No.	11.1
Rev	F

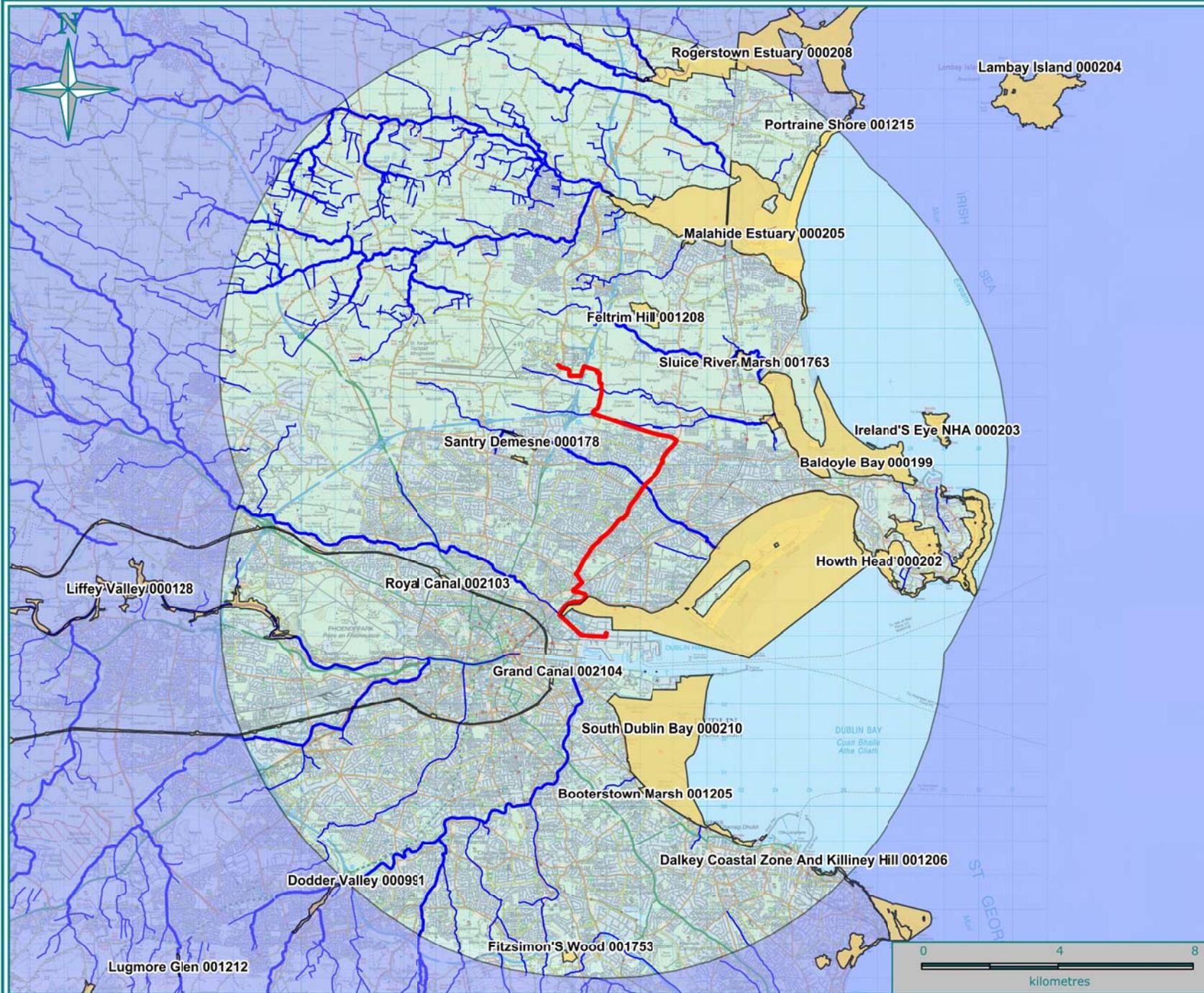


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**Legend**

- Proposed Pipeline Route
- Rivers
- Proposed Natural Heritage Areas

Date	11/03/2015
Name of Client	Fingletn White
Name of Job	EIS for Aviation Fuel Pipeline between Dublin Port - Dublin Airport
Title of Figure	Designated Sites - pNHAs within 10 km of the proposed pipeline route
Scales Used	1 : 160,000 @ A4
Figure No.	11.2
Rev	C



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### 11.4.2 Rare or Protected Species

A desktop study of previous records of rare or protected flora along the proposed pipeline corridor and surrounding area (10 km grid squares O13 and O14) was carried out and a list of plant species was generated (see Table 11.3). The records were obtained from the New Atlas of British and Irish Flora (Preston *et al.*, 2002), the National Biodiversity Data Centre and the NPWS. This list was cross referenced to the list of plant species that are protected under the Flora (Protection) Order, 1999 and listed in the Irish Red Data Book 1 Vascular Plants (Curtis & McGough, 1988). A total of 33 species are listed on Table 11.3, of which 13 are listed on the Flora (Protection) Order, 1999. None of these species were encountered during the walkover surveys carried out for the proposed pipeline corridor.

Rare or protected terrestrial mammals found in both 10 km grid squares O13 and O14 (National Biodiversity Data Centre), and listed on Dublin City Council documents, '*Dublin City Biodiversity Action Plan 2008 – 2012*' along with Fingal County Council's '*Fingal Biodiversity Action Plan 2010-2015*' are presented in Table 11.4. Sixteen mammal species are listed on Table 11.4, of which nine are bats.

Table 11.2: Records of Rare or Protected Flora from Grid Squares O13 and O14

Scientific Name	Common Name	Location	Status	Category	Record Period	Native or Alien
<i>Agrostemma githago</i>	Corncockle			Extinct	1987-1999	Alien
<i>Allium schoenoprasum</i>	Chives		Protected	Vulnerable, Protected (Flora Protection Order)	1970-1986	Alien
<i>Anthemis arvensis</i>	Corn Chamomile			Extinct	1987-1999	Alien
<i>Bromus racemosus</i>	Smooth Brome			Vulnerable	Pre-1970	Native
<i>Calamagrostis epigejos</i>	Wood Small-reed		Protected	Vulnerable, Protected (Flora Protection Order)	1987-1999	Alien
<i>Campanula trachelium</i>	Nettle-leaved Bellflower		(protected) 1987	Endangered	1970-1986	Alien
<i>Carex divisa</i>	Divided Sedge		Protected	Critically Endangered, , Protected (Flora Protection Order)	Pre-1970	Native
<i>Centaurea cyanus</i>	Cornflower			Endangered	Pre-1970	Alien
<i>Erigeron acer</i>	Blue Fleabane			Endangered	1987-1999	Native
<i>Filago minima</i>	<i>Small Cudweed</i>			Vulnerable	2012	Native
<i>Galeopsis angustifolia</i>	Red Hemp-nettle	Feltrim, Dun Laoire and Rathdown	Protected	Endangered, Protected (Flora Protection Order)	1836	Alien
<i>Geranium rotundifolium</i>	Round-leaved Crane's-bill			Endangered	1970-1986	Alien
<i>Groenlandia densa</i>	Opposite-leaved Pondweed	Grand Canal Ringsend, Royal Canal, Camac River	Protected	Endangered, Protected (Flora Protection Order)	1903-1999	Native
<i>Hordeum secalinum</i>	Meadow Barley	Saucerstown, Brackendown, Finglas, Lotts, Glasnevin	Protected	Endangered, Protected (Flora Protection Order)	1836-2007	Native
<i>Hottonia palustris</i>	Water-violet			Vulnerable	1987-1999	Alien
<i>Hypericum hirsutum</i>	Hairy St John's-wort	Santry Court, Drimnagh, Lansdown Valley	Protected	Endangered, Protected (Flora Protection Order)	1833-1999	Native
<i>Hyoscyamus niger</i>	Henbane			Vulnerable	Pre-1970	Alien
<i>Kickxia elatine</i>	Sharp-leaved Fluellen		(protected) 1987	Endangered	1987-1999	Alien

Scientific Name	Common Name	Location	Status	Category	Record Period	Native or Alien
<i>Lamiastrum galeobdolon subsp. montanum</i>	Yellow Archangel			Vulnerable	1987-1999	Native
<i>Lolium temulentum</i>	Darnel			Endangered	Pre-1970	Alien
<i>Misopates orontium</i>	Weasel's-snout		Protected	Endangered, Protected (Flora Protection Order)	Pre-1970	Alien
<i>Ophrys apifera</i>	Bee Orchid			Species not considered threatened in the Republic of Ireland but protected in NI	Pre-1970	Native
<i>Orchis morio</i>	Green-winged Orchid		(protected) 1987	Endangered	Pre-1970	Native
<i>Orobanche hederæ</i>	Ivy Broomrape			Species not considered threatened in the Republic of Ireland but protected in NI	1987-1999	Native
<i>Primula veris</i>	Cowslip			Species not considered threatened in the Republic of Ireland but protected in NI	1987-1999	Native
<i>Pseudorchis albida</i>	Small-white Orchid		Protected	Endangered, Protected (Flora Protection Order)	Pre-1970	Native
<i>Puccinellia fasciculata</i>	Borrer's Saltmarsh Grass or Tufted Saltmarsh Grass	Sandymount, Pigeon House Road, Ringsend	Protected	Vulnerable, Protected (Flora Protection Order)	1840-1906	Native
<i>Salvia verbenaca</i>	Wild Clary		{protected} 1980	Vulnerable	1987-1999	Alien
<i>Scandix pecten-veneris</i>	Shepherd's-needle			Extinct	Pre-1970	Alien
<i>Scrophularia umbrosa</i>	Green Figwort			Endangered	1987-1999	Native
<i>Stachys officinalis</i>	Betony			Endangered, Protected (Flora Protection Order)	2012	
<i>Viola hirta</i>	Hairy Violet	Santry Demesne, Magazine Fort	Protected	Endangered, Protected (Flora Protection Order)	1900-2012	Native
<i>Weissia longifolia</i>	Crisp Beardless-moss			Protected (Flora Protection Order)	1856	

Table 11.3: Rare or Protected Terrestrial Mammals from Grid Squares O13 and O14

Species	Scientific Name	Record Location & Date	Conservation Status	Irish Status on Red Data List
Brown Long-eared Bat	<i>Plecotus auritus</i>	Grid Square O13 & O14 2002, 2008	Protected Species: Habitats Directive Annex IV Wildlife Acts (1976–2012) Dublin City Council Natural Heritage Interest	Least Concern
Brandt's Bat	<i>Myotis brandtii</i>	Greater Fingal Co Area	Protected Species: Habitats Directive Annex IV Wildlife Acts (1976–2012)	Data Deficient
Common Pipistrelle	<i>Pipistrellus</i>	Grid Square O13 & O14 2008, 2012	Protected Species: Habitats Directive Annex IV Wildlife Acts (1976–2012) Dublin City Council Natural Heritage Interest	Least Concern
Daubenton's bat	<i>Myotis daubentonii</i>	Grid Square O13 & O14 2009, 2012	Protected Species: Habitats Directive Annex IV Wildlife Acts (1976–2012) Dublin City Council Natural Heritage Interest	Least Concern
European Otter	<i>Lutra</i>	Grid Square O13 2013	Protected Species: Habitats Directive Annex II and IV Wildlife Acts (1976–2012) Dublin City Council Natural Heritage Interest	Near Threatened
Eurasian Badger	<i>Meles</i>	Grid Square O13 & O14 2013	Protected Species: Wildlife Acts (1976–2012)	Least Concern
Eurasian Pygmy Shrew	<i>Sorex minutus</i>	Grid Square O13 2012	Protected Species: Wildlife Acts (1976–2012)	Least Concern
Leisler's bat	<i>Nyctalus leisleri</i>	Grid Square O13 & O14 2008, 2012	Protected Species: Habitats Directive Annex IV Wildlife Acts (1976–2012) Dublin City Council Natural Heritage Interest	Near Threatened
Nathusius's Pipistrelle	<i>Pipistrellus nathusii</i>	Grid Square O13 2009	Protected Species: Habitats Directive Annex IV Wildlife Acts (1976–2012) Dublin City Council Natural Heritage Interest	Least Concern
Natterer's Bat	<i>Myotis nattereri</i>	Grid Square O13 & O14 2006, 2008	Protected Species: Habitats Directive Annex IV Dublin City Council Natural Heritage Interest Wildlife Acts (1976–2012)	Least Concern
Irish Hare	<i>Lepus timidus hibernicus</i>	Greater Fingal Co Area	Protected Species: Habitats Directive Annex V Dublin City Council Natural Heritage Interest	Least Concern

Species	Scientific Name	Record Location & Date	Conservation Status	Irish Status on Red Data List
Pine Marten	<i>Martes martes</i>	Grid Square O14 2011	Protected Species: Habitats Directive Annex II and V Wildlife Acts (1976–2012)	Least Concern
Red Squirrel	<i>Sciurus vulgaris</i>	Grid Square O13 & O14 2011, 2013	Protected Species: Wildlife Acts (1976–2012)	Least Concern
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	Grid Square O13 & O14 2008, 2012	Protected Species: Habitats Directive Annex IV Wildlife Acts (1976–2012) Dublin City Council Natural Heritage Interest	Least Concern
West European Hedgehog	<i>Erinaceus europaeus</i>	Grid Square O13 & O14 2012, 2013	Protected Species: Wildlife Acts (1976–2012)	Least Concern
Whiskered Bat	<i>Myotis mystacinus</i>	Grid Square O13	Protected Species: Habitats Directive Annex IV Wildlife Acts (1976–2012) Dublin City Council Natural Heritage Interest	Least Concern

### 11.4.3 Habitats in the Existing Environment

#### Habitats

A total of 13 habitats were identified along the proposed pipeline corridor and in the area adjacent to the corridor. The habitat types and codes as per Fossitt (2000) are as follows:

- Depositing Lowland Rivers (FW2)
- Improved Agricultural Grassland (GA1)
- Amenity Grassland (Improved) (GA2)
- Dry Meadows and Grassy Verges (GS2)
- Mixed Broadleaved Woodland (WD1)
- Scattered Trees and Parkland (WD5)
- Scrub (WS1)
- Hedgerows (WL1)
- Treelines (WL2)
- Recolonising Bare Ground (ED3)
- Arable Crops (BC1)
- Buildings and Artificial Surfaces (BL3)

A description of the habitats is provided in this section. Due to the large scale of the habitat survey area and the complexity of the habitats along the entire pipeline corridor, the Habitat Map Figure 11.3 shows the main habitats of ecological significance along the route. In addition Figure 13.1 from Section 13 – Surface Water Quality and Drainage shows the waterbody catchments and the rivers and streams in the wider area.

For most of the 14.4 km pipeline corridor, the pipeline will be laid within public road. The road and adjoining footpaths are all classified as **Buildings and Artificial Surfaces (BL3)** habitat. The pipeline route originates at the proposed inlet station located within Dublin Port. From here the route passes along Tolka Quay and East Wall Road. Along this section, the habitat is entirely Buildings and Artificial Surfaces comprising of the public road system and adjoining footpaths or commercial buildings. There is no vegetation present along this section.

The route then crosses under the Tolka River to Alfie Byrne Road. At the point of crossing, the Tolka River is bound by artificial embankments but is classified as a **Tidal Rivers (CW2)** habitat. There is no accretion of sediments at the foot of the wall but sediments can be seen on the river bed and evidence of the tidal nature of the river is given with the presence of furoid seaweeds on the river bed as well as on the river walls downstream of the footbridge.

On the northern side of the river, the route passes along Alfie Byrne Road (Buildings and Artificial Surfaces habitat), with Fairview Park lying to the west and the Alfie Byrne Open Space to the east. Fairview Park contains a number of habitats with **Scattered Trees and Parkland (WD5)** and **Amenity Grassland (Improved) (GA2)**, the dominant habitats found within the Park. Fairview Park also contains mature **Treelines (WL2)** with Hornbeam trees (*Carpinus betulus*) common. There are Treelines (WL2) and Hedgerows (WL1) along sections of the Alfie Byrne Road.

The route then follows Clontarf Road, Howth Road and Copeland Avenue before turning on to the Malahide Road (R109). The dominant habitat is still **Buildings and Artificial Surfaces (BL3)**. Trees have been planted along the roadside and in areas of the central reservation along the Malahide Road (R109). These trees all tend to be either London Plane (*Platanus x hispanica*) or Sycamore (*Acer pseudoplatanus*). Many of the trees are relatively young and will therefore, as yet, have small root systems that should not extend too far under the road surface.

The Clontarf Golf Course adjoins the Malahide Road. Immediately behind the boundary wall is a strip of **(Mixed) Broadleaved Woodland (WD1)**. The route will not impact this habitat but root systems from some of the mature trees may extend under the boundary wall and underneath the pedestrian walkway. Small areas of **Amenity Grassland (Improved) GA2** occur along the road, including a small park at the junction of Killester Avenue and Malahide Road and a small patch at the junction with Kilmore Road.

The route continues along the Malahide Road (R109), still with **Buildings and Artificial Surfaces (BL3)** habitat, with occasional stretches of the road containing **Treelines (WL2)** habitat in central reservations.

Some of the treelines have a scrub understorey with Brambles (*Rubus fruticosus* agg.) and ornamental Holly (*Ilex* sp.). Just south of the Greencastle Road junction with the Malahide Road the route passes under the Santry River, which is a **Depositing Lowland River (FW2)**. The Santry River flows under a bridge at Coolock and the proposed pipeline corridor will cross under the open channel section of the River. The Santry River is highly modified at this point within an open concrete channel. The proposed route will cross under a small section of the roadside verge containing **Scattered Trees and Parkland (WD5)** at this location.

The proposed pipeline corridor continues along the Malahide Road (R109) to the junction with the R139 (Malahide Road) along **Buildings and Artificial Surfaces (BL3)** habitat. At this last section of the R109 there is a border of **Scrub (WS1)** along the western side of the road, with **Improved Agricultural Grassland (GA1)** fields inside and **Hedgerows (WL1)**. The invasive species Winter Heliotrope (*Petasites fragrans*) is plentiful in this area.

The proposed pipeline corridor runs along the R139 with Darndale Park to the south. Darndale Park contains **Amenity Grassland (Improved) (GA2)** habitat. Along the R139 (on the southern side) there is a border of **Hedgerow (WL1)** habitat with Hawthorn (*Crataegus monogyna*), Bramble, Lime species, Field Maple (*Acer campestre*), Dogwood (*Cornus sanguinea*) and Ivy (*Hedera helix*). The northern side of the R139 has a border of **Hedgerow (WL1)** and **Treeline (WL2)** habitats along most of its length with **Improved Agricultural Grassland (GA1)** fields beyond. The Mayne River, a **Depositing Lowland River (FW2)** runs through the fields here, with a **Treeline (WL2)** of Elder (*Sambucus nigra*), Sycamore (*Acer pseudoplatanus*), Willow species (*Salix* sp.) and Brambles along the channel. Again the invasive Winter Heliotrope is found in places along the length of the R139, with Rhododendron (*Rhododendron ponticum*) close to the roundabout. The proposed pipeline corridor crosses the Mayne River on the R139 at the roundabout, at the junction with the Clonsaugh Road. The river is culverted at the point of the crossing.

Belcamp Park also lies to the south of the R139. The park primarily contains **Amenity Grassland (Improved) (GA2)** and the northern edge of the park has an area of **(Mixed) Broadleaved Woodland (WD1)** with some notable mature Scots Pine (*Pinus sylvestris*). Where the Clonsaugh Road meets the R139, a large patch of **Scrub (WS1)** with mature **Treelines (WL2)** occurs on the western side of the road, although the pipeline corridor will avoid this area.

The route turns north on to the Clonshaugh Road, still following the **Buildings and Artificial Surfaces (BL3)** habitat. As the route continues north, it leaves the urban habitats behind, with the habitats occurring on either side of the road now being **Arable Crops (BC1)**, **Improved Agricultural Grassland (GA1)** with **Hedgerows (WL1)** and **Treelines (WL2)** bordering the road. Along this section, the route crosses under the Cuckoo Stream, **Depositing/Lowland River (FW2)**. At this point, the river is very narrow (approximately 1 m wide) and shallow (maximum depth 25 cm). It is also overhung with dense vegetation and tall trees including Ash, Willow and Bramble.

The route continues along the Clonshaugh Road until it turns west into the Athletic Union Sports Ground, where it crosses **Amenity Grassland (Improved) GA2** habitat. The route then runs in parallel to a dry ditch with **Scrub (WS1)** and **Dry Meadows and Grassy Verges (GS2)** habitats. A patch of Japanese Knotweed (*Fallopia japonica*), an invasive species, is found within this area of rank grassland.

The route then crosses the M1 and continues to the long term car parking and car hire areas at Dublin Airport. The habitat here is **Buildings and Artificial Surfaces (BL3)**. Before finally reaching the Dublin Airport Storage Facility, the route crosses a small patch of **Dry Meadows and Grassy Verges (GS2)** and also areas of **Recolonising Bare Ground (ED3)** and **Scrub (WS1)**. A patch of the invasive species Japanese Knotweed was located to the west of the ALSAA sports grounds as well as occurrences of Winter Heliotrope, Rhododendron and Buddleia davidii within Dublin Airport lands.

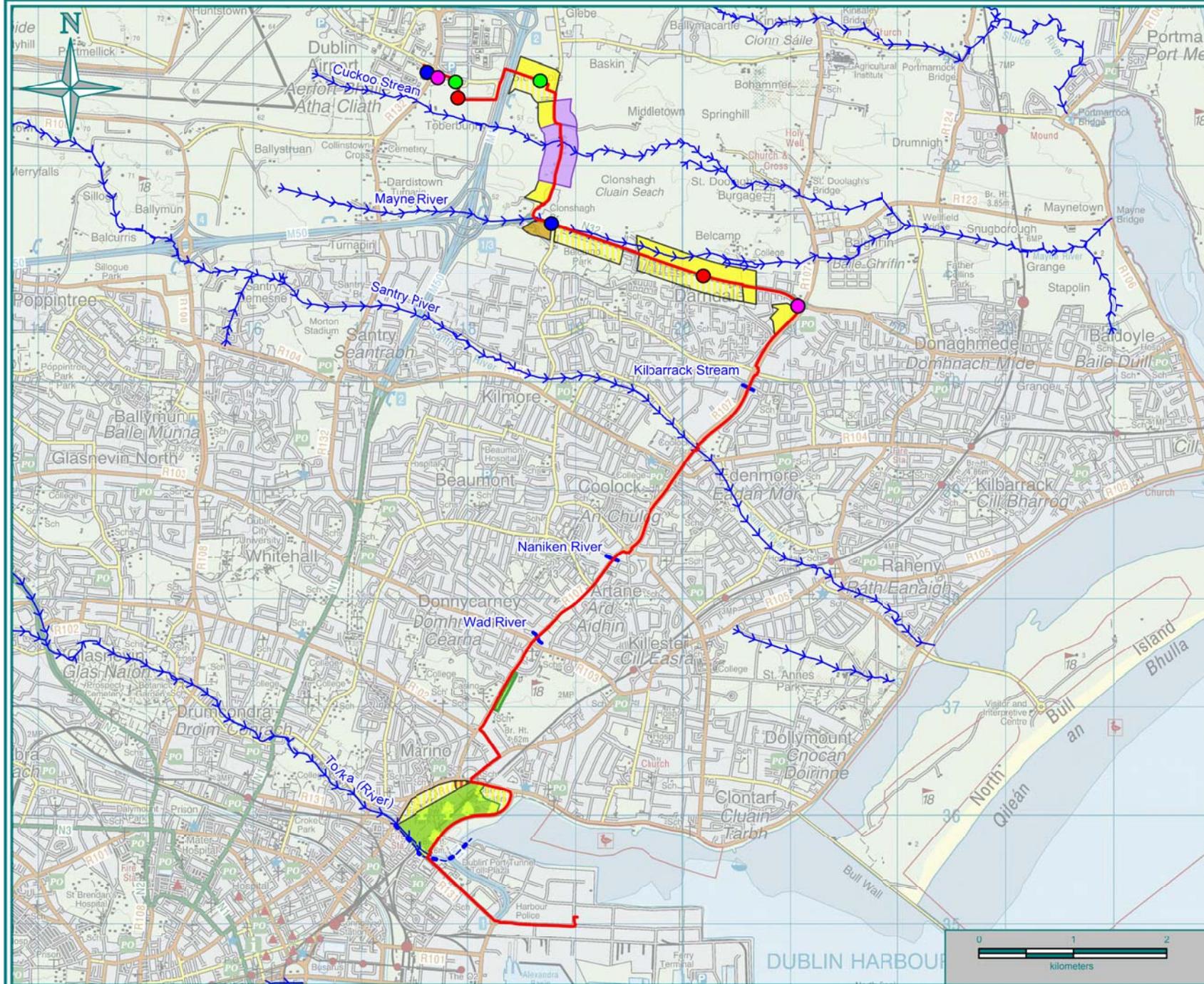
#### *Additional River Systems along the Proposed Pipeline Corridor*

North of the junction with the Malahide Road (R109) and Collins Avenue the Wad River is culverted under the road. Similarly, further north the Naniken River is culverted under the Malahide Road (R109) at Artane. The proposed pipeline corridor crosses the Kilbarrack Stream on the Malahide Road (R109) at Newtown, where it is culverted at the point of the crossing.

These rivers are classed as **Depositing/Lowland Rivers (FW2)**. The river systems crossed by the proposed pipeline corridor are discussed in detail in Chapter 13 – Surface Water Quality and Drainage. The pipeline will cross under each of the river systems using trenchless technology.

#### *Ecological Value of the Habitats*

None of the habitats identified along the proposed pipeline corridor conform to any of the habitat types listed under Annex I of the E.U. Habitats Directive. The habitat types recorded and their ecological evaluation rating are given in Table 11.4 below. The evaluation rating follows that devised by Nairn and Fossitt (2004) and the full evaluation system is given in Appendix 11.1 of Volume 3 of the EIS.



- Legend**
- Proposed Pipeline Route
  - Rivers
  - Watercourse of Culverted Streams/Rivers
  - - - CW2 - Tidal River
- Habitat Overview**
- BC1 - Arable Crops
  - GA1 - Improved Ag Grassland
  - GA2 - Amenity Grassland (Improved)
  - WD1 - Mixed Broadleaved Woodland
  - WD5 - Scattered Trees & Parkland
  - WS1 - Scrub
- Invasive Species**
- Buddleia
  - Japanese Knotweed
  - Rhododendron
  - Winter Heliotrope

Date	12/03/2015
Name of Client	Fingleton White
Name of Job	EIS for Aviation Fuel Pipeline between Dublin Port - Dublin Airport
Title of Figure	Overview of Habitats Along Proposed Pipeline Route
Scales Used	1 : 50,000 @ A4
Figure No.	11.3
Rev	D

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**Table 11.4: List of Habitats and their Ecological Evaluation Rating**

<u>Habitat type</u>	<u>Ecological evaluation rating (after Nairn &amp; Fossitt, 2004)</u>
Tidal Rivers (CW2)	High Value, Locally Important, C rating
(Mixed) Broadleaved Woodland (WD1)	Moderate Value, Locally Important, D rating
Hedgerows (WL1)	Moderate Value, Locally Important, D rating
Treelines (WL2)	Moderate Value, Locally Important, D rating
Depositing/Lowland Rivers (FW2)	Low Value, Locally Important, E rating
Improved Agricultural Grassland (GA1)	Low Value, Locally Important, E rating
Amenity Grassland (Improved) (GA2)	Low Value, Locally Important, E rating
Dry Meadows and Grassy Verges (GS2)	Low Value, Locally Important, E rating
Scattered Trees and Parkland (WD5)	Low Value, Locally Important, E rating
Scrub (WS1)	Low Value, Locally Important, E rating
Recolonising Bare Ground (ED3)	Low Value, Locally Important, E rating
Arable Crops (BC1)	Low Value, Locally Important, E rating
Buildings and Artificial Surfaces (BL3)	Low Value, Locally Important, E rating

The Tolka River (Tidal River habitat) is classed as High Ecological Value, Locally Important, C rating as it does contain semi-natural habitat and is known to support populations of salmonid fish. Otters are also found along the length of the Tolka River, though no signs of Otter were observed at the proposed pipeline corridor crossing point during the walkover surveys.

The hedgerows and treelines found along the pipeline corridor are classed as Moderate Ecological Value, Locally Important, value D rating as they support semi-natural vegetation and are likely to be locally important for wildlife (notably for nesting birds and as feeding or roosting sites for bats). The patch of (Mixed) Broadleaved Woodland at the northern edge of Belcamp Park is also classed as Moderate Ecological Value, Locally Important, as it contains semi-natural vegetation and will be important for other wildlife at a local level. Similarly the patch of (Mixed) Broadleaved Woodland alongside Clontarf Golf club is classed as Moderate Ecological Value.

All other habitats are rated as Low Ecological Value, Locally Important as they are largely artificial or modified habitats with low wildlife value.

#### 11.4.4 Botanical species in the Existing Environment

A total of 77 botanical species were recorded during the botanical survey. The full list of species recorded is given in Table 11.5. None of the plant species recorded are rare or protected as listed under the Flora Protection Order, 1999 or on the Red Data List of Vascular Plants.

The walkover surveys were conducted on 31st January and 1<sup>st</sup> February 2011, 20<sup>th</sup> and 21<sup>st</sup> September 2011 and on 1<sup>st</sup> October 2013. The October survey is just outside of the optimum period for habitat surveys (end of September) however the dominant plant species present could be identified at this time, so that the habitat classifications are valid.

**Table 11.5: List of Botanical Species recorded during Walkover Surveys**

Common Name	Scientific Name
Alder	<i>Alnus glutinosa</i>
Annual Meadow grass	<i>Poa annua</i>
Ash	<i>Fraxinus exelsior</i>
Birch	<i>Betula sp</i>
Blackthorn	<i>Prunus spinosa</i>
Bramble	<i>Rubus fruticosus agg</i>
Butterfly bush	<i>Buddleja davidii</i>
Cocksfoot	<i>Dactylis glomerata</i>
Common Beech	<i>Fagus sylvatica</i>
Common Nettle	<i>Urtica dioica</i>
Conifer spp.	
Cotoneaster	<i>Cotoneaster sp</i>
Crab Apple	<i>Malus sylvestris</i>
Creeping Bent	<i>Agrostis stolonifera</i>
Daisy	<i>Bellis perennis</i>
Dandelion	<i>Taraxacum agg.</i>
Dock sp	<i>Rumex sp</i>
Dog-rose	<i>Rosa canina agg.</i>
Dogwood	<i>Cornus sanguinea</i>
Elder	<i>Sambucus nigra</i>
Elm sp	<i>Ulmus sp</i>
False Oat-grass	<i>Arrhenatherum elatius</i>
Field Maple	<i>Acer campestre</i>
Fuchsia	<i>Fuchsia magellanica</i>
Golden weeping willow	<i>Salix x chrysocoma</i>
Great Willowherb	<i>Epilobium hirsutum</i>
Greater Plantain	<i>Plantago major</i>
Guelder-rose	<i>Viburnum opulus</i>
Hart's-tongue Fern	<i>Phyllitis scolopendrium</i>
Hawthorn	<i>Crataegus monogyna</i>
Hazel	<i>Corylus arvellana</i>
Hedge Bindweed	<i>Calystegia sepium</i>
Holm Oak	<i>Quercus ilex</i>
Honeysuckle	<i>Lonicera periclymenum</i>
Hornbeam	<i>Carpinus betulus</i>
Horse chestnut	<i>Aesculus hippocastanum</i>
Horsetails	<i>Equisetacea agg.</i>
Ivy	<i>Hedera helix</i>
Japanese Knotweed	<i>Fallopia japonica</i>
Knapweed	<i>Centaurea nigra</i>
Large bindweed	<i>Calystegia silvatica</i>
Laurel	<i>Prunus laurocerasus</i>
Leylandii	<i>x Cupressocyparis leylandii</i>
Lime	<i>Tilia x europaea</i>
London Plane	<i>Platanus x hispanica</i>
Monterey Cypress	<i>Cupressus macrocarpa</i>
Moss	
Nipplewort	<i>Lapsana communis</i>

Common Name	Scientific Name
Noble Fir	<i>Abies procera</i>
Norway Maple	<i>Acrea plantanoides</i>
Oak	<i>Quercus sp.</i>
Ornamental cherry	<i>Prunus sp</i>
Ornamental Holly sp	<i>Ilex sp</i>
Ornamental Maple sp.	<i>Acer sp</i>
Poplar sp	<i>Populus sp.</i>
Ragwort	<i>Senecio jacobaea</i>
Rape	<i>Brassica napus</i>
Red Clover	<i>Trifolium pratense</i>
Red Fescue	<i>Festuca rubra</i>
Rhododendron	<i>Rhododendron ponticum</i>
Ribwort Plantain	<i>Plantago lanceolata</i>
Rosebay Willowherb	<i>Chamerion angustifolium</i>
Rowan	<i>Sorbus aucuparia</i>
Scots Pine	<i>Pinus sylvestris</i>
Sea-buckthorn	<i>Hippophae rhamnoides</i>
Silver Birch	<i>Betula pendula</i>
Snowberry	<i>Symphoricarpos albus</i>
Spear Thistle	<i>Cirsium vulgare</i>
Sun Spurge	<i>Euphorbia helioscopia</i>
Sycamore	<i>Acer pseudoplatanus</i>
Thistle spp	<i>Cirsium spp.</i>
Tufted Hair-Grass	<i>Deschampsia cespitosa</i>
White Clover	<i>Trifolium repens</i>
Wild Teasel	<i>Dipsacus fullonum</i>
Willow sp	<i>Salix sp.</i>
Winter Heliotrope	<i>Petasites fragrans</i>
Yarrow	<i>Achillea millefolium</i>

#### 11.4.5 Non-Native Invasive Plant Species along Route

A clump of Japanese Knotweed was noted in the patch of rank grassland along the northern edge of the UAL/FAI Athletic Union Sports Ground and at one location within Dublin Airport . These were the only patches of this plant observed along the proposed pipeline corridor. Japanese Knotweed is a non-native invasive plant species. It is listed on the 'most unwanted' list by Invasive Species Ireland; a joint project between the Northern Ireland Environment Agency and the NPWS. Japanese Knotweed is a threat in open and streamside areas. It can spread rapidly to form dense stands, excluding native vegetation and reducing species diversity. Once stands become established, they are extremely persistent and difficult to remove. This plant has the ability to grow through tarmac and concrete (in some cases within dwellings) and therefore must be cleared prior to construction works.

Winter Heliotrope was found in various locations along the pipeline corridor. It was found on the northern side of the R139 opposite Belcamp Park. It was found close to the junction of the Malahide Road (R109) and Belcamp Lane. This species is listed by Invasive Species Ireland on the 'Amber List: Uncertain Risk'. This category means the species is rated as medium risk, due to the score of the overall assessment. Its impact on conservation goals remains uncertain, due to a lack of data showing impact (or lack of impact). The National Roads Authority describes this as a species with an 'adverse impact on landscape quality, native biodiversity or infrastructure', and 'likely to be encountered during roads schemes' (NRA, 2010).

Rhododendron was found to the north of the R139 close to the roundabout with the Clonsaugh Road. It is also listed on the 'most unwanted' list by Invasive Species Ireland. This species can form very dense thickets and out-compete native plants for space and resources, especially for sunlight.

Other impacts from this plant on fish and invertebrate communities have been recorded. Rhododendron can also prevent access to sites by the sheer mass of plant material blocking paths and right of way (Invasive Species Ireland).

*Buddleia davidii* (*Buddleja davidii*) was found in various locations along the R139 Malahide Road. It was found on the northern side of the road, opposite the junction with Northern Cross Road, and again opposite the junction with Cara Park. It was found on the southern side of the R139 road near the Clonshaugh Road junction as well as at locations with Dublin Airport lands. It is listed by Invasive Species Ireland on the 'Amber List: Uncertain Risk'. This species is a native of China but is common as a garden plant owing to its profusion of flowers which tend to attract a considerable diversity of butterflies (NRA, 2010). It is frequently found in waste ground in urban environments (common in Dublin and Cork), though it has a widespread distribution throughout the country (NRA, 2010).

In addition, invasive species are known to be a threat along the Tolka River (Ms. Maryann Harris DCC Conservation Officer pers. comm) although they were not noted during field surveys of the crossing point.

#### 11.4.6 Mammal Species in the Existing Environment

Two Irish Hares were seen on a patch of rank grassland close to the long term car parking areas at Dublin Airport. Irish Hare is listed on Annex V of the EU Habitats Directive and is protected under the Irish Wildlife Acts (1976–2012). It is listed as of 'least concern' in Ireland's Red List of Terrestrial Mammals (Marnell *et al.*, 2009).

Signs of Fox (*Vulpes vulpes*) and American Mink (*Neovison vison*) were seen at the UAL/FAI Athletic Union Sports Ground. Fox prints were seen in sand around the edge of the entrance car park, whilst a Mink dropping was found on the edge of the rank grassland along the northern edge of the Sports Ground. Fox and Mink are not afforded legal status in Ireland and are listed as of 'least concern' in Ireland's Red List of Terrestrial Mammals (Marnell *et al.*, 2009). Fox are listed as a 'Natural Heritage Interest' in the Dublin City Biodiversity Action Plan 2008–2012 (Dublin City Council, 2008).

Horses and Ponies were noted grazing in the Improved Agricultural Grassland (GA1) habitat north of Belcamp Lane and to the north of the Malahide Road (R139).

Otters are known to occur along the entire stretch of the Tolka River (Dublin City Council, 2008, Fingal County Council, 2003) but no signs or holts were recorded at the location of the proposed pipeline corridor crossing point of the Tolka River.

No other signs of mammals were recorded along the proposed pipeline corridor. Given that the majority of the route follows an existing road and largely occurs within an urban setting this is not surprising. However, areas along the pipeline corridor would be expected to support other populations of Fox. Similarly, Brown Rat (*Rattus norvegicus*) is likely to be widespread along the pipeline corridor, particularly along the watercourses. Hedgehog or Badger may occur along the northern section of the corridor in the Clonshaugh Road area, and both species have previously been recorded in the wider area.

Previous records of other protected mammals found in the wider area are listed on Table 11.5. Species on this list such as Pygmy Shrew, Pine Marten and Red Squirrel have all been recorded in the wider area however they are unlikely to be found in the mostly urban environment in which the proposed pipeline corridor is located. The only grassland area through which the pipeline corridor passes is the Athletic Union Sports Ground, and none of these mammals were found there during the walkover surveys.

#### 11.4.7 Bat Species in the Existing Environment

The proposed development will involve works in the road carriageway for the majority of its length. Only a very small section of the pipeline corridor will cut through Amenity Grassland and Scrub at the UAL/FAI Athletic Union Sports Grounds. High levels of street lighting are present in the vicinity of this area which is generally not attractive to foraging bats.

An appraisal of the suitability of the habitats present along the proposed pipeline corridor for bats was carried out.

Bats are likely to forage and/or roost in various locations in the vicinity of the proposed pipeline corridor such as the treelines along the Alfie Byrne Road and Copeland Avenue, the broadleaved woodland at Clontarf Golf Club, the treelines along the R139 and the Clonsaugh Road, and around the treelines, scrub and woodland areas at Belcamp and Darndale Parks. Bats will use cracks, crevices and holes present in mature trees as roosting sites whilst the shelter provided by the trees' foliage provides excellent habitat for insect and feeding sites for bats. Bat species will also use houses as roosts and the abundance of housing along the pipeline corridor provides roosting opportunities for bats.

The River Tolka is not considered to have good bat potential at the location of the pipeline corridor crossing as there is little cover along the river at this point and there is a lot of lighting.

Whilst there was no evidence of any roost of appreciable size along the proposed pipeline corridor, due to the presence of suitable breeding habitat (i.e. mature trees) it is best practice to assume that some bats may breed along the in the area.

#### 11.4.8 Winter Bird Survey

The winter bird survey focussed on the presence of Brent Goose in two distinct count units; a) the Alfie Byrne Open Space and Tolka Estuary and b) Belcamp Park. However, all waterbirds and gulls observed were recorded.

A survey report including methods and results is available in Appendix 11.2 of Volume 3 of the EIS. A summary of the results is provided in this section. The survey was carried out by means of two fixed Vantage Points (VP) on one date per month from November 2013 to March 2014. One surveyor observed and monitored birds on the River Tolka Inner Estuary and the Alfie Byrne Road Open Space (counted hourly), and a second surveyor concurrently observed birds at Belcamp (counted half-hourly). The VP locations are shown on Figure 10.4.

#### **Brent Activity at Tolka Estuary and Alfie Byrne Green Space**

During the surveys in the area of the Tolka Estuary and Alfie Byrne Open Space, a total of 68 Brent flightlines were recorded. On only two occasions were Brent recorded foraging in the Alfie Byrne Open Space before flying onto the estuary. One of these was in December when a single bird was recorded for 30 minutes. In March a flock of 197 Brent landed on the grass at Alfie Byrne Road from the mudflat. The birds were disturbed by dogs back onto the mudflat, with 98 returning followed by a further 21. These 119 were disturbed again by joggers back onto the mudflat, and did not return. The total Brent presence on the grass at Alfie Byrne Road in March was 82 minutes.

A total of 112 minutes of Brent presence on the Alfie Byrne Road Open Space was recorded which equates to 6.22% of the total survey time.

On 16 occasions Brent were recorded flying over the Alfie Byrne Open Space. On the estuary itself smaller flocks of Brent tended to filter 'up' the estuary from the east indicated by 47 flightlines 'in' to the study area at the Tolka and 18 'out' of it. The lowest amount of activity was recorded in December, with only six flightlines.

The mean number of Brent on the Tolka Estuary over the five visits was 108.03. Brent occurred during each survey (monthly) with a maximum count of 747 in February. On the Alfie Byrne Road Open Space, there was one Brent on the grass in December and a flock of 197 in March giving a mean of 9.06 individuals over the winter. No Brent were recorded on the grass during the other three survey dates.

Thirty one other bird species were recorded during the survey of the Tolka Estuary and Alfie Byrne Open Space (see Table 10.9). Of these only Black-tailed Godwit and Bar-tailed Godwit were present for part of the time in nationally important numbers (140 and 160 respectfully which represents 1% of the national population).

Also of note are the red-listed species including Black-headed Gull, Wigeon, Goldeneye, Dunlin, Redshank, Curlew and Herring Gull. Records for each month show, as expected, the numbers across the hours of each visit rose and fell with the tide as the mudflat became exposed and covered.

On the Alfie Byrne Open Space, Black-headed Gull used this site from November to January moving onto it around high tide in small numbers (maximum 72 in January). Oystercatcher were recorded on two single counts, one in November and one in December involving seven birds each time.

### Brent Activity at Belcamp Park

No flight activity of Brent was recorded in Belcamp Park in November. In February there was one flightline event consisting of 201 Brent Geese leaving the park. In March there were three flightlines, with the birds arriving in two flocks (98 and 106 birds respectively) and leaving together after 36 minutes.

There was more activity in December and January with eight and 15 flightlines recorded respectively, with flock size varying from 36 to 308 birds. Brent were observed flying over the feeding area of Belcamp and other parts of the park plus over the adjacent housing estate on seven occasions. Birds also circled over the feeding area without landing to feed even when there was no identifiable disturbance present.

There was a minimum of 271 minutes of Brent presence on the playing pitches at Belcamp Park, accounting for 16.42% of the total survey time.

Brent were found to forage on only a small area of Belcamp Park, in the southwest of the park. A walkover survey in February throughout the park identified that the two adjacent playing pitches in the southwest quarter of the park had significant amounts of goose droppings indicating regular feeding there. No other part of the park had goose droppings. Disturbance to Brent caused by dogs and joggers was occasionally recorded during the surveys.

From the half hourly count data a maximum of 286 Brent were present at any one time, but when analysing the flightline data the maximum number grazing at any one time onsite was 308 in January. The Brent came and went frequently in various numbers so at each half hourly count time numbers could be low or absent resulting in a mean across the five visits of 24.85 individuals but rising to 140.65 when the counts of Brent from the flight line data (a result of continuous monitoring) were added.

The flight lines recorded at Belcamp indicate that there is a lot of movement between inland grassland sites. Birds seem to fly in from parks or straight up from the Dublin Bay area from the southeast, or from the playing pitch at Darndale. A small area only of Belcamp Park playing pitches is regularly used by Brent and then only for part of the winter, particularly in December and January. The playing pitches at Darndale appear to be utilised by Brent also but a third observer would have been required to survey here simultaneously. Brent seem to be able to cope with regular disturbance so when they are chased from one grassland site they 'hop' over to the next one or back to Dublin Bay.

Three species of gull, three species of wader and one Grey Heron were recorded, except in March when no birds landed into the park other than the Brent geese (see Table 10.10). A mean of 25.65 Black-headed Gull was recorded during the winter indicating that they were by far the most numerous gull recorded. Two Black-tailed Godwits made it over the houses to feed in Belcamp Park within two half hour periods in January. Maximums of 19 Curlew and 64 Oystercatcher were recorded in December proving that grassland in this public park is attractive to species other than Brent.

In summary, internationally and nationally important numbers of Brent were recorded at the Tolka during December and February and Belcamp in January. 1% of the international flyway population equates to 260 birds, with the national (all Ireland) threshold is also 260 (Crowe, 2005). Figures above this for a single site are ecologically significant (Benson, 2009).

### I-WeBS Data

The Dublin Bay area is counted regularly by BirdWatch Ireland as part of the I-WeBS scheme. Data for the numbers of Brent Geese counted as part of the I-WeBS scheme was supplied by BirdWatch Ireland together with full data on all species counted. The I-WeBS scheme splits Dublin Bay into two count sections; North Bull Island and Sandymount Strand (from the South Wall to the west pier at Dun Laoghaire).

The Tolka Estuary is not specifically counted by the I-WeBS scheme. A copy of the I-WeBS data for all birds recorded is presented in Appendix 11.4 of Volume 3 of the EIS. The data for Brent Geese is reproduced below in Table 11.6. Dublin Bay supports internationally important numbers of Brent Geese.

**Table 11.6: Numbers of Brent Geese in Dublin Bay (Data source, I-WeBS counts)**

	05/06	06/07	07/08	08/09	09/10	Mean count	Peak count
North Bull Island	3,893	2,497	3,579	3,735	4,689	3,679	4,689
South Wall - West Pier Dun Laoghaire	1,755	864	510	1,425	847	1,080	1,755



**Legend**

**Legend**

- Proposed Pipeline Route
- Vantage Points for Winter Bird Survey

Date	11/03/2015	
Name of Client	Fingleton White	
Name of Job	EIS for Aviation Fuel Pipeline between Dublin Port - Dublin Airport	
Title of Figure	Location of Fixed Vantage Points for Winter Bird Survey	
Scales Used	1 : 50,000 @ A4	
Figure No.	11.4	Rev B

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Table 11.7: Cumulative Data for Birds Recorded on Alfie Byrne Open Space and Tolka Estuary

Survey Date	Nov 2013		Dec 2013		Jan 2014		Feb 2014		March 2014		Mean Over 5 Visits
Scientific name	Max total	mean	Max total	mean	Max total	mean	Max total	mean	Max total	mean	
Little Grebe	2	0.28	1	0.14	1	0.43	3	0.57			0.28
Great Crested Grebe							1	0.14	2	0.57	0.14
Cormorant	2	0.71	1	0.14	2	1.14	2	1.14	2	1.86	1
Little Egret									1	0.28	0.06
Grey Heron	2	0.71	7	4.43	3	1	4	1.57	1	0.71	1.68
Mute Swan	1	0.28	2	0.57	3	1.86	3	1.86	5	2.71	1.46
Brent Goose 1	61	16.57	282	61.71	106	15.86	747	385.86	153	60.14	108.03
Brent Goose 2			1	0.14					197	45.14	9.06
Shelduck	10	1.42					1	0.14	2	0.28	0.37
Wigeon			2	0.28	1	0.28					0.11
Teal	3	0.43	3	0.57					4	1.14	0.43
Mallard					4	1	3	1	2	0.43	0.49
Goldeneye					1	0.14					0.03
Red-breasted Merganser	2	1			8	2	3	1.14	18	12.43	3.31
Oystercatcher	50	20.43	53	15.57	11	4.43	7	2.43			8.57
Grey Plover	1	0.43	2	0.28	4	1.25	1	0.43			0.48
Knot					14	2			17	2.71	0.94
Dunlin	397	152	53	14.86	300	76	151	21.57	294	64.86	65.86
Black-tailed Godwit	4	1.42	5	1.86	10	4.86	384	115.43	568	196.14	63.94
Bar-tailed Godwit	84	35.71	168	44.42	118	38	179	29.57	28	4.43	30.43
Curlew	84	40.71	16	3.43	43	17.14	27	11.43	39	11.71	16.88
Redshank	141	68.86	169	31.71	161	73.14	193	101.14	291	102.86	75.54
Greenshank			2	0.43	4	1.43	2	0.71	3	0.71	0.66
Turnstone	4	1.57	5	1.57	11	3.28	2	0.28	7	1	1.54
Black Guillemot							2	0.57	3	0.86	0.29
Black-headed Gull	852	511.71	161	106	555	257.3	674	318	166	107	260
Common Gull	18	11.43	3	1.86	11	4.14	7	5.28	12	4.57	5.46
L. Black-backed Gull			1	0.43	2	1.43	10	4.57	11	5.14	2.31
Herring Gull	224	118.86	36	18.28	144	50.28	140	70.43	119	62.43	64.06
Great Black-backed Gull	4	2	4	2.14	3	1.86	3	2.28	7	2.57	2.17
Black-headed Gull 2	50	7.14	20	7.86	72	10.28					5.06
Oystercatcher 2	7	1	7	1							0.4
Mediterranean Gull					1	0.28					0.06
Great northern Diver							2	0.28			0.06
Shag							1	0.28			0.06

**Table 11.8: Cumulative Data for Birds Recorded in Belcamp Park**

Survey Date	Nov 2013		Dec 2013		Jan 2014		Feb 2014		March 2014		Mean Over 5 Visits
Scientific name	Max total	mean	Max total	mean	Max total	mean	Max total	mean	Max total	mean	
Pale-bellied Brent Goose			26 160*	2.5 15.5*	286	105	201	16.75	204*	17*	140.65*, 24.85
Grey Heron	1	0.16									0.032
Oystercatcher	24	6.16	64	27.5	1	0.08	5	0.42			6.832
Black-tailed Godwit					2	0.25					0.05
Curlew	10	1.5	19	3							
Black-headed Gull	123	64.75	49	30.58	56	25.33	38	7.58			25.65
Common Gull	2	0.42	3	1.58	11	4.25	1	0.25			1.3
Herring Gull	2	0.58	5	2.08	5	2.83	1	0.17			1.13

\* means when including Brent that arrived and left Belcamp between half hourly counts

11.4.9 Other Birds in the Existing Environment

Table 11.9 shows the other bird species recorded along the proposed pipeline corridor during the walkover surveys on 31<sup>st</sup> January and 1<sup>st</sup> February 2011, the 20<sup>th</sup> and 21<sup>st</sup> September 2011 and on 1<sup>st</sup> October 2013. In total, 29 species were recorded. It also gives the conservation status of the species. The conservation status of a bird species is determined by whether it is listed under Annex I of the E.U. Birds Directive and also by its status on the Birds of Conservation Concern in Ireland List (BoCCI) (Colhoun & Cummins, 2013). Birds of high conservation concern are Red-listed or globally threatened, declining rapidly in abundance or range, or having undergone historic declines from which they have not recently recovered. Amber-listed species, of medium concern, have an unfavourable status in Europe, have moderately declined in abundance or range, have a very small population size, a localised distribution, or occur in internationally important numbers (Colhoun & Cummins, 2013). Green-listed species are not currently of particular conservation concern.

**Table 11.9: Bird Species Recorded along Proposed Pipeline Corridor**

Common Name	Scientific Name	Conservation Status - BoCCI & Annex I
Blackbird	<i>Turdus merula</i>	
Black-headed gull	<i>Larus ridibundus</i>	Red-listed
Blue Tit	<i>Parus caeruleus</i>	
Brent Goose	<i>Branta bernicla</i>	Amber-listed, Annex I species
Chaffinch	<i>Fringilla coelebs</i>	
Coal Tit	<i>Parus ater</i>	
Collared Dove	<i>Streptopelia decaocto</i>	
Common Gull	<i>Larus canus</i>	Amber-listed
Dunnock	<i>Prunella modularis</i>	
Feral Pigeon	<i>Columba livia</i>	
Goldcrest	<i>Regulus</i>	
Greenfinch	<i>Carduelis chloris</i>	Amber-listed
Grey Heron	<i>Ardea cinerea</i>	
Herring Gull	<i>Larus argentatus</i>	Red-listed
Hooded Crow	<i>Corvus cornix</i>	
House Sparrow	<i>Passer domesticus</i>	Amber-listed
Jackdaw	<i>Corvus monedula</i>	
Magpie	<i>Pica</i>	
Mallard	<i>Anas platyrhynchos</i>	
Mistle Thrush	<i>Turdus viscivorus</i>	Amber-listed
Moorhen	<i>Gallinula chloropus</i>	
Mute Swan	<i>Cygnus olor</i>	Amber-listed
Pied Wagtail	<i>Motacilla alba</i>	
Redwing	<i>Turdus iliacus</i>	
Robin	<i>Erithacus rubecula</i>	Amber-listed
Rook	<i>Corvus frugilegus</i>	
Starling	<i>Sturnus vulgaris</i>	Amber-listed
Woodpigeon	<i>Columba palumbus</i>	
Wren	<i>Troglodytes</i>	

Two species that are Red-listed on the BoCCI list were recorded along the pipeline corridor; these were Black-headed Gull and Herring Gull. Both species were recorded on the Tolka River, close to the proposed river crossing area. Large numbers of both species were also recorded to be using the Tolka Estuary during the site walkover surveys and also during the winter bird survey for Brent Geese (see Table 10.7). Black-headed Gull is resident along all Irish coasts, with significant numbers arriving from the Continent in winter.

It breeds both on the coast and inland where they will often nest in colonies. Usually, it nests on the ground in wetland areas, such as bogs and marshes and will also use man-made lakes. It is a Red-listed species due

to its rapidly declining and localised breeding population. Herring Gull breeds in colonies around the coast of Ireland and also inland in Co. Donegal and Co. Galway. The biggest colony in Ireland is on Lambay Island off Co. Dublin with over 1,800 nests. It is also Red-listed due to a decline in its breeding population.

Eight species that are Amber-listed were recorded; Brent Goose, Common Gull, Greenfinch, House Sparrow, Mistle Thrush, Mute Swan, Robin and Starling. During the February 2011 site visit, approximately 50 Brent Geese were seen feeding on a soccer pitch within Fairview Park and large numbers were noted in the Tolka Estuary. Common Gull and Mute Swan were noted on the Tolka River, whilst House Sparrow and Starlings were seen in Fairview Park and in private gardens along the pipeline corridor.

Consultation with the local NPWS Conservation Ranger revealed that a small, remnant population of Yellowhammer, *Emberiza cirinella* and Tree Sparrow, *Passer montanus* are known to occur in Belcamp Park, although neither of these two species were recorded during the walkover surveys. Yellowhammer is Red-listed on the BoCCI list, whilst Tree Sparrow is Amber-listed.

In general, the species recorded are typical of the urban environment in which they were recorded. The proposed pipeline corridor passes alongside a number of parkland areas, with Amenity Grassland (GA2) and Scattered Trees and Parkland (WD5) habitat. Although these are highly modified habitats they are known to provide shelter for birds under pressure from the built environment. Indeed Dublin is the greenest city in Europe with 20% of the space consisting of parks and 25% consisting of gardens (Ní Lamhna *et al.*, 2012).

#### 11.4.10 Aquatic Ecology and Freshwater Fish

A desktop study on the biological water quality of the rivers crossed by the pipeline corridor was carried out using Q value ratings obtained by the EPA at various sampling locations along these rivers, between 1996 and 2007 (<http://gis.epa.ie/Envision>). The Q values obtained at the relevant EPA water quality monitoring locations on the Tolka River, Santry River and Mayne River are given in Table 11.10. No data was available for the other 4 streams/rivers crossed by the proposed pipeline corridor.

**Table 11.10: EPA Biological River Water Quality Ratings in Receiving Waters**

Site ID	River	Waterbody Sampled	Distance from Pipeline	Q-Value 1996	Q-Value 1998	Q-Value 2002	Q-Value 2005	Q-Value 2007
09T011100	Tolka	Tolka1_Lower	4 km u/s	3	2-3	2-3	2/0	3
09S010300	Santry	Santry1	2 km d/s	2	1-2	2	2-3	2-3
09M030500	Mayne	Mayne1	5 km d/s	2-3	2/0	3	3	3

The current status of the Tolka, Santry and Mayne is Q2-3, Q3, or 'poor' status. In addition, all three rivers are classed as 'at risk of not achieving good status' by 2015 in accordance with the targets of the Water Framework Directive. This is discussed in further detail in Chapter 13 – Surface Water Quality and Drainage.

#### Fish in the Watercourses Crossed by the Proposed Pipeline Corridor

Consultation with IFI provided information on the status of the rivers crossed by the proposed pipeline corridor in terms of salmonid fish. The Tolka River represents a regionally significant salmonid system, although it is not a designated Salmonid River under the European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. No. 293/1988). It is known to naturally hold some stocks of wild Brown Trout, but is also stocked by local angling clubs.

Some sea trout fishing is available on the lower reaches of the river. It is also noted in the *Dublin City Biodiversity Action Plan 2008–2012* as supporting Brown Trout. In addition, juvenile Salmon have also recently been recorded travelling upstream as far as Finglas (DCC and FCC consultation).

The Cuckoo stream and the Mayne River are non-salmonid at present however with habitat and water quality improvement they have the potential to become salmonid systems. The Santry River is also non-salmonid due to the presence of a number of impassable features located towards the lower end of the system. The Wad is extensively culverted and non-salmonid.

## 11.5 Potential Impacts of the Proposed Pipeline on Ecology

The construction of the proposed pipeline could potentially have negative impacts on the flora and fauna communities within the proposed planning corridor.

As each working area will be fenced off, wider impacts on the flora and fauna communities will be slight with impacts becoming imperceptible with the increase in distance (and time) from the construction phase.

Operation of the pipeline is not expected to result in any impacts on the ecology of the area, except in the case of a leak from the pipeline.

### 11.5.1 Mitigation by Avoidance and Design

The following measures were undertaken to reduce impacts on designated sites, flora and fauna through avoidance and design:

- The pipeline route has been designed in accordance with best practice such as IS EN 14161: 2011 (ISO 13623:2009 modified) which stipulated the avoidance of direct impacts on designated sites (Annex D)
- The route has been selected to pass through areas of high regulation which require a road opening licence which will control third party interference
- Pipeline wall thickness is 12.7 mm
- The pipeline will be protected from excessive leakage in the event of a rupture by the use of emergency shutdown valves
- The fibre-optic communications cable laid above the pipeline has a secondary function of causing the pipeline to shut down in the event of third part interference
- The trench will be backfilled with 300 mm of sand and pea gravel, then 700 mm of lean mix concrete to 200 mm below ground surface. A Cathodic Protection system will be utilised to prevent corrosion to the pipe (and hence leakage events)
- Existing vacant sites with hardstand areas will be utilised for site compounds thus reducing landtake associated with the development
- Underground trenchless techniques will be utilised at river and stream crossings as an alternative to more invasive open-cut methods.

### 11.5.2 Potential Impacts on Designated Sites

The proposed pipeline corridor does not lie within, or cross through, any site that has been designated for nature conservation, and thus there will be no direct impacts on these sites, in terms of size or scale or landtake during construction, operation or decommissioning phases of the proposed pipeline. A NIS has been prepared to determine the risk to Natura 2000 sites and accompanies this EIS.

As described in Section 11.3.1, there are a total of 34 designated sites lying within a 10 km radius of the pipeline corridor. For the majority of these sites, there are no links (via hydrology for example) and indirect impacts can also be ruled out due to their respective distances from the pipeline.

A number of other sites are situated downstream of the proposed pipeline corridor with the potential for indirect impacts via hydrological links.

These include:

- North Bull Island SPA
- North Dublin Bay cSAC (and pNHA)

- South Dublin Bay and River Tolka Estuary cSAC (and pNHA)
- Baldoyle Bay cSAC, SPA and pNHA

### Construction Impacts on Designated Sites

Indirect impacts may occur during construction as follows:

- It is possible that vibrations associated with construction works under the river bed, may cause a temporary disturbance to migrating fish associated with designated sites downstream
- Transport of Invasive species may result in the inadvertent spread of invasive species of aquatic Flora which may reach designated sites downstream which are hydrologically linked
- Release of run-off from contaminated material or made ground as a result of excavations may indirectly affect Aquatic habitat quality and thus available habitat for species of conservation interest such as Brent Geese, Otter etc.
- Trenchless drilling techniques may result in inadvertent release of lubricating material such as Bentonite and thus affect available habitat for species of conservation interest such as Salmonids, Otter etc.
- The release of silt or contaminants such as fuel or oil, into local watercourses which could impact designated sites situated downstream. Open cut construction methods will be used for the majority of the pipeline corridor (though the trenches will be backfilled and temporarily reinstated each evening where possible) which occurs in the public roadway
- Dewatering activities have the potential to affect groundwater which may make its way into designated sites
- During the construction phase of the development, there will be increased human presence associated with the works as well as increased machinery and noise levels. This has the potential to have a negative impact through disturbance and displacement of birds (e.g. Brent Goose) from the South Dublin Bay and River Tolka Estuary SPA and North Dublin Bay pNHA particularly when the pipe is being laid along the Alfie Byrne Road.

### Operational Impacts on Designated Sites

- During operation of the pipeline, the main potential risk to designated sites is a leak from the pipeline, in particular for those sites which are hydrologically linked
- Maintenance operations may also result in further release of suspended solids in areas adjacent to water features which may indirectly affect aquatic habitats downstream in designated sites
- Maintenance operations may result in the release of contaminated material or made ground if encountered, which may indirectly affect aquatic habitats in designated sites downstream
- Fuel leaks from compounds may occur during operational periods and may indirectly affect aquatic habitats and thus conservation interests of sites hydrologically linked
- Third party interference may result in pipeline damage and consequent spillage or release of fuel which may indirectly affect designated sites which are hydrologically linked.

### Decommissioning & Re-Validation Impacts on Designated Sites

As part of the decommissioning or re-validation processes the pipeline will be emptied of fuel and flushed with water sourced from mains. The water will then be collected, sampled for contaminants and disposed of either to a surface water body if uncontaminated or collected and taken offsite for disposal at an appropriate wastewater treatment facility (under licence) if contaminated. This will be conducted under licence from the respective local authority.

It is considered unlikely that any unmitigated impacts will be significant from these processes.

### 11.5.3 Potential Impacts on Habitats and Flora

#### **Construction Impacts on Habitats and Flora**

Over the majority of its length, the pipeline will be laid in the existing roadway, or Buildings and Artificial Surfaces (BL3) habitat, within the pipeline corridor. This is a habitat of low ecological value, and the pipeline has been proposed in this habitat to ensure minimal impacts on the local ecology. This is a 'mitigation by avoidance' measure.

A small section of Improved Amenity Grassland (GA2) at the Athletic Union Sports Ground will be stripped during the construction works. However impacts will be localised within the 'working area'. This habitat has been classed as being of Low Value, Locally Important. Removal of existing Scrub (WS1) adjacent to this area will be avoided, where possible.

Again, at the northern end of the pipeline corridor, there will be some small scale removal of Dry Meadows and Grassy Verges (GS2), Recolonising Bare Ground (ED3) and Scrub (WS1) habitats. These habitats have been classed as being of Low Value, Locally Important. Again, this habitat loss will be temporary and habitat reinstatement will ensure that any long-term impacts are slight.

There will be no impact on the aquatic environment as all crossings will be carried out using a trenchless technique. This means that the pipeline will be bored underneath the bed of the river and for the Santry and Tolka some 1.2m and 2 m respectively, below the bed of the river. There will also be no requirement for in-stream works. The Launch and entry pits will be located away from the waterbody and mitigation measures will be put in place to ensure that run-off in the vicinity of the works is controlled (refer to Chapter 13 – Water Quality & Drainage).

No rare or protected flora species were recorded along the proposed pipeline corridor. The main area where vegetation will be removed in order to facilitate construction of the pipeline is at the Athletic Union Sports Ground and at the Tolka River crossing. Measures will be taken to ensure that areas outside of the designated work area are not damaged by erecting fences which will restrict the movement of plant and machinery.

Measures to control the spread of the invasive Japanese Knotweed, which was identified in this area during surveys, will be taken. An invasive species management plan has been included in Appendix 11.5 of Volume 3 of the EIS.

The pipeline corridor will pass numerous treelines in some parts of the Alfie Byrne Road, Malahide Road, the R139 and the Clonshaugh Road. Trees can be damaged during construction through direct impact and damage to the tree; through physical severance of major roots (i.e. roots greater than 25 mm in diameter) and also through the drying out of roots following exposure during excavation work. The current route has been selected to avoid trees, however amendments to the preferred route with the pipeline corridor may result in the removal of tree(s) or partial root system. Thus there is potential for permanent negative impacts on trees from construction works. Prior to construction, a qualified arboriculturist will carry out tree surveys within the proposed planning corridor to establish where tree removal or modification (roots) is required. Any subsequent works will be conducted under the required felling licence.

Release of contaminated material or made ground as a result of excavations may indirectly affect habitat quality.

#### **Operational Impacts on Habitats and Flora**

- Once the pipeline is operational there will be no further negative impact(s) on habitats or flora in the existing environment during day-to day operations. There will however be the potential for impact on habitats in the event of an uncontrolled and unmonitored leak
- Maintenance operations may also result in further release of suspended solids in areas adjacent to water features which may indirectly affect aquatic habitats
- Maintenance operations may result in the release of contaminated material or the removal of contaminated made ground if encountered, which may indirectly affect aquatic habitats
- Fuel leaks from compounds may occur during operational periods and may indirectly affect adjacent habitats
- Third party interference may result in pipeline damage and consequent spillage or release of fuel which may indirectly affect adjacent habitats.

## Decommissioning & Re-validation Impacts on Habitats and Flora

As part of the decommissioning process the pipeline will be emptied of fuel and flushed with water sourced from mains. The water will then be collected, sampled for contaminants and disposed of either to a surface water body if uncontaminated or collected and taken offsite for disposal at an appropriate wastewater treatment facility (under licence) if contaminated. This will be conducted under licence from the respective local authority.

It is considered unlikely that any unmitigated impacts will be significant from this processes.

### 11.5.4 Potential Impacts on Fauna

#### Construction Impacts on Fauna

##### Terrestrial Mammals and Bats

The habitats along the proposed pipeline corridor are limited in terms of their value for mammals but species such as Fox and Brown rat are likely to be common within the largely urban environment of the route. Otters may also use the Tolka River for foraging. Further north along the Clonshaugh Road, there may be occasional Hedgehog or Badger foraging associated with the agricultural habitats in the surrounding landscape.

The mammal community in the vicinity of the pipeline corridor will be subject to short term disturbance and/or displacement during the construction phase of the project. However, given that there is an abundance of suitable habitats in the wider environment, affected mammals will most likely relocate to other locations.

There was no evidence in that the proposed development will impact on any habitats of importance for mammal species. Given the availability of suitable habitats in the surrounding landscape, the proposed development will not have long-term negative impacts on local mammal populations. Any disturbance to Otters at the location of the Tolka River crossing point will be short term and temporary as it is anticipated that this crossing will take 2 – 4 weeks to complete.

The mature trees and hedgerows that are present along the pipeline corridor do provide feeding and roosting opportunities for bats. As discussed in Section 10.3.7, bats are likely to forage and/or roost in various locations in the vicinity of the route such the treelines along the Alfie Byrne Road, the broadleaved woodland at Clontarf Golf Club, the treelines along the R139 and the Clonshaugh Road, and around the treelines, scrub and woodland areas at Belcamp Park. As mentioned, the development will not involve works to any buildings, or bridges, or the destruction or disturbance to trees or hedgerows along the pipeline corridor. The main impact from construction works on bats would be a temporary negative impact through disturbance caused by machinery and noise in the vicinity of treelines and hedgerows. Measures will be taken to minimise impacts on bats such as lighting restrictions. In addition pre-construction bat surveys will be carried out if the removal of trees are required. These measures will ensure there is no negative impact on bats from construction works.

#### Operational Impacts on Fauna

##### Terrestrial Mammals and Bats

Once the pipeline becomes operational there will be no further negative impact(s) on mammals in the existing environment. In the event of a leak, i.e. a 1 in 5,130 event (refer to AMEC report in Appendix 2.1 of Volume 3 of the EIS), and it being proximate to a waterbody the potential exists for impacts on aquatic mammals such as otter.

## Decommissioning Impacts on Fauna

### Terrestrial Mammals and Bats

As part of the decommissioning process the pipeline will be emptied of fuel and flushed with water sourced from mains. The water will then be collected, sampled for contaminants and disposed of either to a surface water body if uncontaminated or collected and taken offsite for disposal at an appropriate wastewater treatment facility (under licence) if contaminated. This will be conducted under licence from the respective local authority.

It is considered unlikely that any unmitigated impacts will be significant from these processes.

### 11.5.5 Potential Impacts on Birds

#### Construction Impacts on Birds

The potential impacts on Brent Geese associated with the South Dublin Bay and River Tolka Estuary SPA and North Dublin Bay pNHA are discussed in Section 11.4.1.

Bird surveys carried out along the Alfie Byrne Road and the Tolka Estuary, and at Belcamp Park indicated that some water bird species of high conservation concern use these areas. Table 11.9 and Table 11.10 show the species recorded during the winter bird surveys in these areas. Of note is the presence of Black-tailed Godwit and Bar-tailed Godwit which were present in the Tolka Estuary for part of the time in nationally important numbers (140 and 160 respectively as 1% of the national population). Also of note are the red-listed species including Black-headed Gull, Wigeon, Goldeneye, Dunlin Redshank, Curlew and Herring Gull.

Works adjacent to the Tolka River and Belcamp Park could lead to temporary disturbance to localised numbers of these species but given the availability of alternative areas, and the existing high background noise in the areas, these impacts are likely to be slight.

In order to avoid disturbance to wintering Brent Geese along the Tolka Estuary and Alfie Byrne Road, and Belcamp Park, construction works in these areas will be scheduled outside the winter months (October to March). Thus works are likely to occur during the bird breeding season which will result in a negative impact on breeding birds within the treelines and hedgerows adjacent to the proposed pipeline corridor.

The birds typical of the largely urban environment, as described in Section 11.3.9, will be impacted by a temporary negative disturbance during the construction period. However, birds in this area are accustomed to high levels of background noise and as works will be temporary in nature and will be undertaken in a phased approach along the route the disturbance impact is expected to be slight.

#### Operational Impacts on Birds

Once the pipeline becomes operational there will be minimal impact(s) on birds in the existing environment. Routine maintenance may result in slight disturbance to birds utilising areas adjacent to the proposed pipeline. In the event of a leak, i.e. a 1 in 5,130 year (refer to AMEC report in Appendix 2.1 of Volume 3 of the EIS), and it being proximate to a waterbody the potential exists for impacts on aquatic avifauna.

#### Decommissioning Impacts on Birds

As part of the decommissioning process the pipeline will be emptied of fuel and flushed with water sourced from mains. The water will then be collected, sampled for contaminants and disposed of either to a surface water body if uncontaminated or collected and taken offsite for disposal at an appropriate wastewater treatment facility (under licence) if contaminated. This will be conducted under licence from the respective local authority.

It is considered unlikely that any unmitigated impacts will be significant from these processes.

### 11.5.6 Potential Impacts on Aquatic Ecology

#### **Construction Impacts on Aquatic Ecology**

- The area of highest importance for fisheries and aquatic fauna is the Tolka River. However, there will be no direct impacts on the Tolka as the pipeline will cross under the river bed using trenchless techniques. There will be however the potential for siltation of water bodies from uncontrolled run-off from works on the banks or in proximity to the waterbody.
- It is possible that vibrations associated with construction works under the river bed, may cause a temporary disturbance to migrating fish.
- Transport of Invasive species may result in the inadvertent spread of invasive species of aquatic Flora.
- Fuel leaks during refuelling may indirectly affect Aquatic habitat quality.
- Release of run-off from contaminated material or made ground as a result of excavations may indirectly affect Aquatic habitat quality
- Trenchless drilling techniques may result in inadvertent spillage of lubricating material (if required) such as Bentonite in the event of a frac-out.

#### **Operational Impacts on Aquatic Ecology**

- Maintenance operations may also result in further release of suspended solids in areas adjacent to water features which may indirectly affect aquatic habitats
- Maintenance operations may result in the release of contaminated material or made ground if encountered, which may indirectly affect aquatic habitats
- Third party interference via other road works may result in pipeline breakage and consequent spillage or release of fuel which may indirectly affect adjacent habitats.

#### **Decommissioning Impacts on Aquatic Ecology**

As part of the decommissioning process the pipeline will be emptied of fuel and flushed with water sourced from mains. The water will then be collected, sampled for contaminants and disposed of either to a surface water body if uncontaminated or collected and taken offsite for disposal at an appropriate wastewater treatment facility (under licence) if contaminated. This will be conducted under licence from the respective local authority.

It is considered unlikely that any unmitigated impacts will be significant from these processes.

### 11.5.7 Do-Nothing Impact

In the event of a do-nothing scenario the existing environment will remain as it is. Given the urban location of the proposed pipeline route, it is highly likely that other developments will take place. Emission from road tankers will continue to increase with increased fuel demands for the airport which can indirectly impact on ecosystems.

## **11.6 Mitigation Measures for Flora and Fauna**

### **During Construction Mitigation**

The following mitigation measures are recommended:

1. Watercourses on the pipeline corridor will be crossed using trenchless techniques rather than open cut technology in order to minimise disturbance to the river and its downstream receiving environment. This will ensure that there is no physical disturbance to the waterbody during construction
2. Further consultation with the IFI will take place (Eastern River Basin District) for all works associated with watercourses prior to construction for assessment and approval
3. Any water produced from dewatering activities will be discharged in accordance with agreements reached with the local authority. These are likely to include discharge under licence to local

watercourses after passing through temporary settlement ponds or being pumped directly into a tanker for off-site licenced discharge

4. Excavated material from the roadway will be loaded directly onto an awaiting vehicle and transported off site by a permitted contractor to an appropriate facility
5. Construction works along the Alfie Byrne Road and Malahide Road (R139) will only be carried out during the period May to September in order to prevent disturbance to any wintering Brent Geese. Re-instatement works such as permanent road re-surfacing will be carried out where possible within this time frame
6. Where possible, the destruction or removal of any mature vegetative cover will be conducted outside of the avian breeding season (March-August), as required by the Wildlife Act 1976 (as amended). This will reduce disturbance and/or displacement impacts of the development on breeding bird species
7. If the felling of tree(s) is required, then this will be carried out in accordance with NRA guidelines (NRA 2006). This will optimally be conducted in the periods September-November or April-May (NRA, 2006) and will be conducted under the advice of a suitably qualified expert (e.g. NPWS personnel or an Ecologist). Immediately prior to felling, the trees will be examined by a specialist for the presence of bats.
8. A tree survey of all trees along the pipeline corridor which will be directly impacted (prior to construction) will be undertaken by a qualified arboriculturist. The survey should be carried out prior to construction and 3 – 5 years following construction. These surveys will determine the baseline condition of any trees prior to construction and then determine whether damage has been caused during construction. The arboriculturist is to advise on any remedial action required to any tree damage
9. No disturbance to habitats or flora outside the pipeline corridor will occur
10. Post-construction, the habitats removed will be re-instated (with shrubs replacing any mature trees). This will minimise the impact of habitat loss. The presumption will be to use native species however, non-native species may be more appropriate in order to complement existing planting schemes and policies
11. Good working practices will prevail throughout construction. For example, machinery, equipment, fuel and other materials associated with the development will be stored appropriately (e.g. banded fuel tanks at the temporary construction compounds). Litter and other waste material will also be stored and disposed of appropriately. Refuelling of machinery and plant will occur offsite. This will minimise the potential risk of damage or pollution to wildlife and their habitats
12. The clump of Japanese Knotweed identified during surveys is to be managed in accordance with Best Practice Guidelines available on the Invasive Species Ireland website ([www.invasivespeciesireland.com](http://www.invasivespeciesireland.com)) and according to the NRA (2010) 'Guidelines on the Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads'. An invasive management plan has been included in Appendix 11.5 of Volume 3 of the EIS. At present the options for control of Japanese Knotweed are to treat it with an appropriate herbicide application or to excavate the material. Disposal of dead material can either be on-site, in which case it is to be buried to at least 5 m depth, or by transporting to an appropriate waste management facility
13. Any dewatering will be carried out in accordance with local authority agreements, with the water either discharged to water bodies under licence and having been passed through temporary settlement ponds, or pumped to tanker for discharge at an authorised discharge point.

## Operational Mitigation Measures

### Monitoring

The pipeline will be operated in accordance with operated in accordance with I.S. EN 14161:2011 – *Petroleum and Natural Gas Industries – Pipeline transportation systems* (ISO 13623:2009 modified) This will ensure that best practice is followed from the start of the operation.

The following control systems will be put in place:

1. *Monitoring & Control* - A Supervisory Control and Data Acquisition System (SCADA) will monitor the operations. A PLC based alarm system will alert the on-call operator using a pager. If the operator fails to respond, a backup callout via 24 hour call centre service will be initiated to the emergency response team, details of which are provided in the outline emergency response plan
2. Computational Model pipeline leak detection (CPM) - with automatic shutdown will be installed in compliance with API Recommended Practice 1130 (2007, Reaffirmed 2012) and German TRFL ("Technische Regeln für Fernleitungen" - Technical Rules for Pipelines) which requires two different leak detection methods. One leak detection model will be capable of detecting leaks during transients

e.g. starting up, shutting down and changing flow conditions. The leak detection systems will be chosen from specialist leak detection vendors with a significant installed base and proven track record on similar fuel product pipelines in Europe, the UK and as agreed with Dublin Fire Brigade

3. *Visual Leak detection* - Fortnightly inspections will be carried out on the pipeline route. An operator will survey the route on foot to detect factors that could affect the safety and the operation of the pipeline. Inspections will identify any third party activities along the route which may encroach on the pipeline.
4. *Maintenance* - Regular inspection of the inlet stations, filters, valves and other fittings will take place on a planned maintenance schedule. This will ensure that the line is properly maintained and meets the safety requirements. Within the first year of operation an inline corrosion survey/intelligent pigging run will be carried out to establish a baseline. This will be repeated every 10 years.

Further details in relation to these systems are included in the Chapter 3 – Description of the Proposed Development and the Design Basis Report in Appendix 3.2 of Volume 3 of the EIS.

#### Emergency Response Procedure

1. A set of emergency response procedures is to be put in place to cover the unlikely event of an accident with the pipeline. This safety plan will include a communications link to Dublin Port, Dublin City Council, Fingal County Council and Dublin Airport Authority. The plan will be based on existing plans used by the aviation fuel transportation industry in the UK and adapted and modified as necessary to meet local conditions. An outline emergency response plan is included in Appendix 3.7 of Volume 3 of the EIS.

#### **Decommissioning & Re-Validation Mitigation Measures**

As part of the decommissioning process the pipeline will be emptied of fuel and flushed with water sourced from mains. The water will then be collected, sampled for contaminants and disposed of either to a surface water body if uncontaminated or collected and taken offsite for disposal at an appropriate wastewater treatment facility (under licence) if contaminated. This will be conducted under licence from the respective local authority.

It is considered unlikely that any unmitigated impacts will be significant from these processes.

##### 11.6.1 Residual Impacts

With the successful application of mitigating measures the residual impacts post construction will be negligible. Overall, given the fact that the pipeline is to be laid within the existing road surface and that trenchless techniques are to be used for watercourse crossings, combined with the limited duration of the construction period, it is unlikely that there will be any significant effects on the local flora and fauna communities.

During operation, a regular programme of maintenance will be implemented during the lifetime of the pipeline. This combined with the continuous monitoring and the design of the pipeline will significantly minimise the potential for a leak event (i.e. 1 in 5,130) from the pipeline during operation.

The residual impacts, post construction and during operation of the pipeline will depend on leak occurring and its location. However provided that the mitigation measures (including emergency response plan) are implemented as proposed the impacts are anticipated to be very low.

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