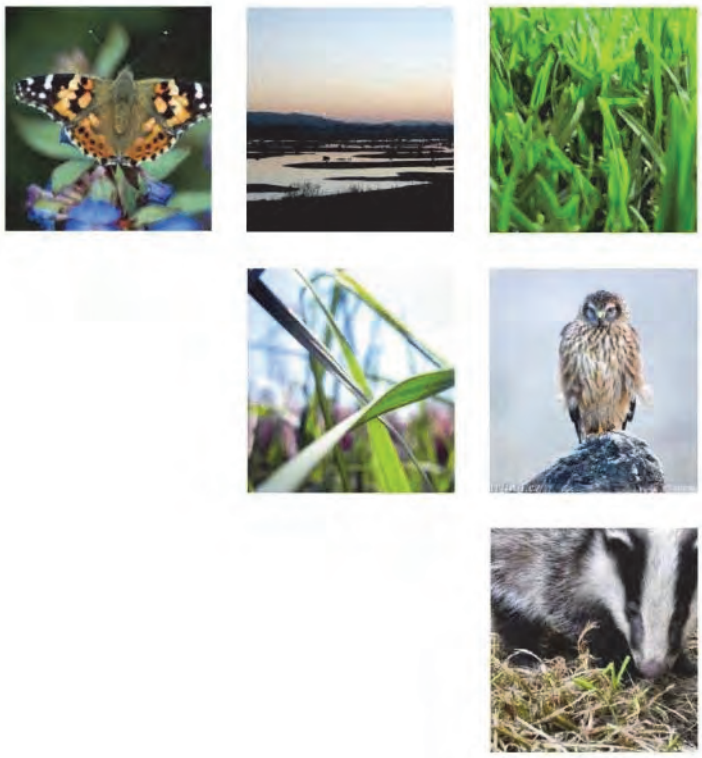

APPENDIX 5.1

SCOPING REPORT

ENVIRONMENTAL SCOPING REPORT FOR PROPOSED AVIATION FUEL PIPELINE

MARCH 2014

FEHILY TIMONEY & COMPANY

ENVIRONMENTAL SCOPING REPORT FOR PROPOSED AVIATION FUEL PIPELINE

User is Responsible for Checking the Revision Status of this Document

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Client: Fingleton White & Co. Ltd.

Keywords: Aviation fuel pipeline, EIA/EIS, traffic, noise, archaeology, construction

Abstract: This scoping document sets out the proposed content and methodology for the environmental impact assessment of the proposed aviation fuel pipeline development.

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1 INTRODUCTION

1.1 The Applicant

The Applicant is Fingleton White on behalf of Independent Pipeline Company Ltd.

The developer is Independent Pipeline Company Ltd. whose shareholders are Fingleton White and Reynolds Logistics.

Fingleton White is an engineering company with a record of management, design and construction of petroleum oil and gas infrastructure, while Reynolds Logistics is the largest road distribution company for oil products in Ireland. Reynolds Logistics currently transport by tanker 60% of the aviation fuel to Dublin Airport. Both companies operate 24/7 response systems.

1.2 Planning History

Fingleton White received permission in 2001 from Dublin City Council (planning ref 0189/00) and Fingal County Council (F99A/0063) for the construction of a 150 mm diameter pipeline for the transport of aviation fuel from Dublin Port to Dublin Airport. An environmental report rather than an environmental impact statement (as the development was sub-threshold for a mandatory EIS) accompanied the application. The Dublin City grant was appealed to An Bord Pleanala by third parties. The Board upheld the decision of Dublin City Council (Planning ref PL29N.122692). This permission lapsed and it is now the applicant's intention to apply for permission to lay a 200 mm diameter pipeline (to cater for increased demand) along a revised route through Dublin City Council and Fingal County Council functional areas.

Since 2008 Fingleton White has carried out a complete review of the design of the pipeline and route selection. The leak detection proposed will contribute to the mitigation measures to reduce the environmental impact. Additional route options have been examined and throughout this process, discussions have been held with Dublin City Council and Fingal County Council.

Fehily Timoney & Company (FTC) has been commissioned to prepare the EIS and this scoping document has been prepared to inform the preparation of the EIS. FTC has worked on this project since 2010 and reviewing the alternative routes from an environmental perspective.

1.3 The Development in Summary

The proposed pipeline route traverses two local authority functional areas – namely Dublin City Council and Fingal County Council. Consequently two planning applications will be made in tandem to each planning authority. Each application will be accompanied by a planning report, environmental impact statement (EIS) and at a minimum a Stage 1 Screening report for Appropriate Assessment (AA).

The pipeline will be operated by Fingleton White with standby backup provided by Reynolds Logistics.

The 14.2 km proposed pipeline will transport aviation fuel from a pumping station at Dublin Port to a receiving station at Dublin Airport as indicated on Figure 1.1. This type of development is not a new concept and is in operation in UK and EU cities including Heathrow, Gatwick, Birmingham, Manchester, Amsterdam Frankfurt, Brussels, Zurich, Luxembourg. Some of these pipelines have been in operation since 1950. The major oil companies currently operating in Ireland use these UK and European pipelines. They will use the proposed pipeline because this transportation mode will ensure that the fuel supply chain is safe and flexible.

The pipeline will be operated using a telemetry system and can be monitored and controlled from the Dublin Docks and Dublin Airport.

The pipeline will be located predominantly within the road carriageway. Sections will be located along the eastern boundary of Darndale Park as well as the Athletic Union League- Football Association of Ireland (AUL- FAI) Sports Complex at Clonshaugh. There will be seven crossing points of watercourses including the Tolka, Santry, Mayne, Wad and Nanniken Rivers and the Cuckoo and Kilbarrack Streams.

Temporary construction compounds will be located at Dublin Docks and Clonshaugh Road area for the duration of the construction works. Additional detail on their location and layout will be provided in the EIS.

The applicant is applying for a planning corridor, to include public road, footway and verges to allow for micrositing at construction stage around existing services. Where the route passes through green areas and private amenity areas the planning corridor will be 8 m in width. Details of wayleaves and consents will be detailed in a planning report which will accompany the planning application to the two local authorities.

Currently, aviation fuel is transported from Dublin Port to Dublin Airport via road tankers. The largest permitted road tankers are used, each having a capacity of 40,000 litres. At the current demand for fuel, this equates to approximately 15,500 tanker trips per year. The transportation of petroleum products by tanker along busy commuter roads raises a number of issues including the routing of the tankers through the Dublin Port Tunnel. A safety and environmental impact evaluation conducted by AMEC UK Limited concluded that the transportation of fuel via the proposed pipeline has a significantly lower level of risk than the alternative use of road tankers.

Significant consultation has been undertaken with the various departments within Fingal County Council and Dublin City Council which has resulted in the emergence of a route which will now form the basis of a planning application to both Local Authorities. It is proposed to undertake further consultation during the scoping of the EIS with further details on this provided in Section 1.6 of this report.

1.4 Planning Process for the Proposed Development

In 2009, pre-consultation was undertaken with An Bord Pleanála under Section 37B of the Planning and Development Acts as amended to determine if the proposed development was Strategic Infrastructure. A decision was given by the Bord in August 2010 (PC.0088) stating that the application was in fact not strategic infrastructure development and that consent should be sought through the traditional planning route.

Consequently two planning applications will be submitted, one to Dublin City Council for the section of the pipeline route from Dublin Port to Clonshaugh with a second to Fingal County Council for the section from Clonshaugh to Dublin Airport.

The requirement for the preparation of an environmental impact statement to accompany a planning application is set out in the European Union Directive 2011/92/EU *on the assessment of the effects of certain public and private projects on the environment*. This requires member states to ensure that a competent authority carries out an assessment of the environmental impacts of certain types of project, as listed in the Directive, prior to development consent being given.

With respect to pipelines, Annex 1 states that a mandatory EIS is required for:

> "*Pipelines with a diameter of more than 800mm and a length of more than 40km:*
>
> - *For the transport of gas, oil, chemicals, and,*
> - *For the transport of carbon dioxide (CO_2) streams for the purposes of geological storage, including booster stations."*

While Annex 2 includes:

> *"Oil and gas pipeline installations and pipelines for the transport of CO_2 streams for the purposes of geological storage (projects not included in Annex 1)."*

The requirements of this Directive have been transposed into Irish law by the Planning and Development Regulations 2001 as amended.

As the proposed pipeline is 14.2 km in length and will be used for the transportation of aviation fuel, Annex 1 and Annex 2 do not apply. However, given the characteristics of the proposed development, through densely populated areas and under the Tolka River (which drains to North Dublin Bay, (a designated Special Area of Conservation (SAC) and proposed Natural Heritage Area), an EIS was requested by the planning authorities under Article 103 of the Regulations. This provision allows a local authority to request an EIS for a sub-threshold development if the planning authority "*considers that the development would be likely to have significant effects on the environment*".

With the planning application being accompanied by an EIS, the application will be made to the planning authorities under Section 172 of the Planning and Development Act 2000 as amended. It is the intention of the Applicant to apply for a 10 year planning permission.

Screening will be undertaken to determine if an appropriate assessment of the project is required. If the screening assessment indicates that an appropriate assessment is required, a Natura Impact Statement (Stage 2) will be prepared and submitted with the planning application and EIS.

1.4.1 Additional Consents

A number of other consents will be required for the proposed development. These will include a foreshore licence for the proposed crossing of the Tolka River and road opening licences for works within the roadway. Details of these consent processes will be included in the EIS. In addition, wayleaves will be required from the Dublin Airport Authority (DAA), -AUL-Football Association of Ireland (FAI) and Irish Rail. Consent will also be sought from the Dublin Port Company.

1.4.2 Seveso Development

The pipeline is not a Seveso development as defined in EU Council Directive 2012/18/EU on the Control of Major Accident Hazards involving Dangerous Substances of which Article 2 – Scope states:

"*This directive shall not apply to (any of) the following:*

> *(d) the transport of dangerous substances in pipelines including the pumping stations outside establishments covered by this directive."*

1.5 Purpose of Scoping

The purpose of the EIS scoping process is to identify the issues which are likely to be important during the environmental impact assessment and to eliminate those that are not. The scoping process will identify the sources or causes of potential environmental effects, the pathways by which the effects can happen, and the sensitive receptors, which are likely to be affected. The issues identified in the scoping process will be examined in the EIS, any potential impacts will be quantified, mitigation measures proposed as required, and residual impacts described. The scoping process will also identify the appropriate level of detail for the information to be provided in the EIS.

There is provision in the legislation for formal scoping of an EIS. The person preparing the EIS can request the competent authority, in this case Dublin City Council and Fingal County Council, to provide a written opinion on the information to be contained in the EIS.

The alternative to formal scoping is informal scoping. This can be undertaken by the authors of the EIS through direct consultation with the relevant statutory and non-statutory consultees. Informal scoping is proposed for this EIS.

1.6 Consultation

A consultation process is being undertaken by Fingleton White and the EIS team and is based on:

- Meetings with:
    - Relevant departments and Area Management within DCC and FCC
    - Dublin Airport Authority
    - Dublin Port Company
    - Iarnrod Eireann
    - AUL-FAI Ltd.

It is also the intention of the applicant to consult with local elected members. Two public information days (one in each local authority area) will be held and details of these events will be included in the EIS.

Article 28 of the Planning and Development Regulations (as amended) requires that certain bodies are contacted depending on the nature of the potential impacts of a development.

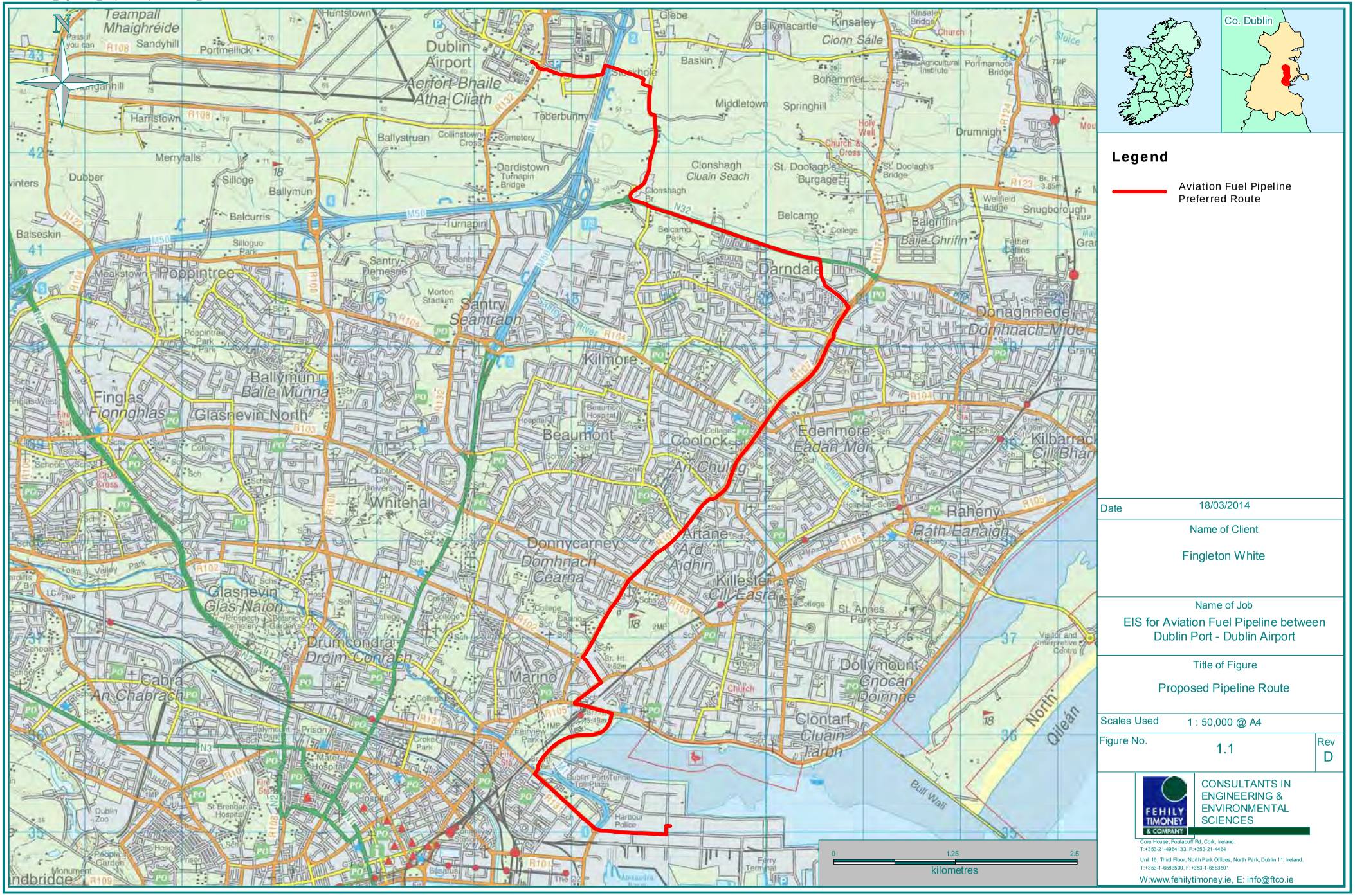
Consultation letters will be sent to a number of interested groups and organisations inviting them to submit observations in relation to the proposed route (refer to Table 1.1). A map indicating the proposed route will accompany each of these letters. Observations/submissions received during the consultation process will be incorporated into the EIS where appropriate.

Table 1.1: List of Proposed Consultees

Organisation
An Taisce, Heritage Officer
BGE (Telecom)
Bat Conservation Ireland
Birdwatch Ireland, Senior Conservation Officer (Research & Surveys)
BirdWatch Ireland, Senior Conservation Officer
Bord Gáis Networks
Bord Failte Eireann
Bord Iascaigh Mhara
BT Ireland
Bus Eireann
Colt Telecom
Commission for Energy Regulation
Department of Arts, Heritage and the Gaeltacht
Department of Agriculture, Fisheries and Food
Department of Communications Energy and Natural Resources, Coordination Unit
Department of Transport, Tourism and Sport
Dublin Airport Authority
Dublin Bus
Dublin City Council – Archaeologist
Dublin City Council, Water Division
Dublin City Council, Drainage Division
Dublin City Council , Roads and Traffic Division
Dublin City Council, Environment Section
Dublin City Council Transport 21
Dublin City Council, Heritage Officer

Organisation
Dublin City Council, Conservation Officer
Dublin City Council - Head of Waste Management
Dublin City Council - Environmental Health Officer
Dublin City Council - Parks & Landscape Service Division
Dublin Docklands Development Authority
Dublin Fire Brigade HQ - Chief Fire Officer
Dublin Port Company
Eircom (Services)
ESB Networks Dublin North
ESB Networks Dublin Central
Eastern River Basin District
euNetworks Ireland Ltd
E-Net
Fingal County Council - Environmental Health Officer
Fingal County Council - Head of Waste Management
Fingal County Council, Heritage Officer
Fingal County Council, Water Division
Fingal County Council, Environment Section
Geological Survey of Ireland
Level 3 Communications Ireland
Health Service Executive
Health and Safety Authority
Iarnrod Eireann
IDA Ireland
Imagine Communications Ltd (Services)
Inland Fisheries Board
Irish Wildlife Trust, Development Officer
Irish Aviation Authority
Irish Water
National Monuments
National Roads Authority
National Heritage Council , Planning & Development Officer
National Parks and Wildlife Service, Eastern Divisional Manager
National Transport Authority
Magnet Entertainment
Minister for Transport, Tourism and Sport
Office of Public Works
Railway Procurement Agency, Environmental Officer
Railway Procurement Agency, Project Manager (Metro North)
SMART Telecom
Transport 21 Office
Transroute Tunnel Operations
UPC (Chorus & NTL Communications)
Verizon Business
Vodafone Networks (Managed by Atkins Global)

R:\Map Production\2010\LE10\727\01\Workspace\
LE10-727-01_Figure 1.1_Proposed Pipeline Route_Rev D



Date	18/03/2014
Name of Client	Fingleton White
Name of Job	EIS for Aviation Fuel Pipeline between Dublin Port - Dublin Airport
Title of Figure	Proposed Pipeline Route
Scales Used	1 : 50,000 @ A4
Figure No.	1.1
Rev	D

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2 PROJECT DESCRIPTION

2.1 Details of the Proposed Pipeline

The pipeline will be used to transport Jet A1 aviation fuel (kerosene) which is categorised as a Category B substance and has a relatively high flash point of >38°C. The pipeline will be designed, constructed and operated in accordance with BS PD 8010 – 1:2004: *Code of Practice for Pipelines Part 1: Steel Pipelines on Land* and the design criteria shown in Table 2.1 will apply.

Table 2.1: Pipeline Design Criteria

Design Criteria	Details
Pipeline Length	14.2 km
Pipeline Diameter (nominal)	200 mm
Pipeline wall thickness	12 mm
Design Pressure	40 bar
Maximum Allowable Operating Pressure (MAOP)	40 bar
Projected Annual Throughput	1,500 million litres per annum
Depth of Cover (Nominal)	1.2 m
Corrosion Coating	3 ply polyethylene
Product – Substance Carried	Jet A1 Aviation Fuel (Category B Substance)
Section Isolation Valves	2 no
Cathodic Protection	To: BS 7631-1:1991,BS 12954:2001 & IS EN 50162:2004

Aviation Fuel Jet A1 is kerosene. Stocks of kerosene held in Ireland are generally aviation fuel with dye added at tanker loading facilities to distinguish uses. Kerosene has many uses. In addition to aviation fuel it is used as a fuel for domestic central heating, stand alone domestic heaters, camping stoves and lights. In these situations the kerosene is stored in plastic tanks or containers within the curtilage of the house. Kerosene is stable in normal conditions. Vapour will not form unless the temperature is > 38° - 42°C. The fuel will not ignite unless the temperature is > 220°C.

The safest way to transport this fuel is by pipeline. The failure frequency of this pipeline, which has been designed with inbuilt mitigation measures, is approximately 100 times lower than that for a road tanker. Details of a risk assessment, comparing the two transport mechanisms will be included in the EIS.

In the unlikely event of damage to the pipe the fuel may leak from the pipe and form a pool around the pipe. As part of the operators emergency plan the fuel will be pumped out into a tanker. The fuel stays in a liquid form. The procedure for cleanup is similar to that for a spillage from a tanker, PPE, notification to statutory bodies, prevent spreading of fuel, absorb fuel and remove or pump fuel to a tanker.

The hazards associated with Jet A1 fuel are skin irritations, oedema if swallowed.

The expected life of the pipeline is 50 years, after which it can be revalidated for a further period. This includes for continued use as an aviation fuel pipeline or alternatively as a water or gas pipeline (following decommissioning).

In the UK, which has an extensive network of fuel pipelines, the HSE is the regulating authority. All the pipelines are operated as per the UK Pipeline Safety Regulations. It is proposed that this pipeline will also be operated as per UK Pipeline Safety Regulations and will be independently audited on an annual basis by an internationally recognised body, such as the British pipeline Agency. The audit report will be submitted to both Dublin City Council and Fingal County Council.

In the event that decommissioning of the pipeline is required, this will be carried out in accordance with BS PD 8010 – 1:2004: *Code of Practice for Pipelines Part 1: Steel Pipelines on Land*. The pipeline will be emptied and cleaned with water. Disposal of the water will require consent from the appropriate Water Authority. The pipeline can then be used for gas and water.

There is no financial risk for Dublin City Council and Fingal County Council relating to the abandonment of the pipeline. The asset value of the secure 200 mm pipeline, which has other uses, is significantly greater than the cost of decommissioning. The issue of financial security will be discussed in detail in the Planning Report.

2.2 Site Description & Location Context

The surrounding land use is predominantly urban and the pipeline passes through a number of residential areas. Industrial, enterprise and employment areas are predominantly located at the start and end of the pipeline route in the Dublin Docklands area, East Wall Road and in the Dublin Airport area. There are a number of neighbourhood services facilities such as shops, restaurants, bars, etc. along the route as well as larger shopping centres and educational facilities.

The route crosses four rivers/streams namely (from North to South) the Cuckoo Stream, Tributary of the Mayne River, Santry River and the Tolka River. In addition, three culverted rivers/streams will be crossed.

Open Spaces along the route include Darndale Park and the FAI Athletic Union Sports Ground.

The proposed pipeline route does not lie within any site that has been designated for nature conservation. It does, however, lie adjacent to the South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay pNHA, Santry Demesne pNHA and Royal Canal pNHA. Further detail on the site description and location context will be provided in the EIS.

2.3 Construction Methods

The linear and repetitive nature of the works is similar to the works required to provide other utility infrastructure such as water, drainage, gas, telecoms, electricity. It lends itself to a progressive and sequential form of construction. The proposed pipeline route can be divided into three discrete working zones. The pipeline will be laid simultaneously in each zone. An average of 24m of pipeline per day will be laid by each team. It is proposed that the trenches will be backfilled and temporarily reinstated each evening, ensuring minimum disruption to pedestrians, home owners and businesses. Further details will be included in the Construction Management Plan. An open-cut approach using trenching, width 500 mm to 700 mm, will be adopted as it is a standard method for the construction of a steel pipeline of this nature. To date approximately 200 km of similar steel pipelines ranging from 600 mm to 100 mm have been laid through urban areas in Ireland (gas network). In more difficult locations, such as crossings of rivers, alternative approaches including trenchless techniques, will be used to minimise the environmental impacts of construction works at these locations.

The sequence of construction works will be as follows:

- Route Proving - The precise position of the route within the carriageway cannot be confirmed in advance due to the considerable number of existing services and the level of confidence in the as built drawings for these services. The final location of the pipeline will be confirmed within the consented planning corridor through trial holes carried out by the contractor in advance of each section of work
- Establishment of a Traffic Management Plan in agreement with Dublin City Council and/or Fingal County Council Roads & Traffic departments
- Open cut trench excavation including the sawing of carriageway, breakout of the surface, excavation to approximately 1.2 m
- Pipe laying operations and reinstatement of the trench and road surface

- Testing & Commissioning - The pipeline will be pressure tested to ensure it meets design requirements in accordance with BS PD 8010 – 1:2004: *Code of Practice for Pipelines Part 1: Steel Pipelines on Land*. Water from the public water supply will be used and subsequently disposed of in agreement with the relevant authority
- The pipeline is then dried, fuel is admitted and the pipeline is pressurised in accordance with BS PD8010 – 1:2004. The pipeline then becomes operational.

2.3.1 Special Crossings

A number of Special Engineering Difficulties (SED's) have been identified along the route which will require permission from the relevant authorities to install the pipeline over and/or under their respective structures. These are listed in Table 2.2.

Table 2.2: Location of Special Engineering Difficulties (SED's)

SED Location	Permission Required From
Railway Bridge Clontarf Road	Iarnród Éireann
Tolka River Crossing - East Wall Road	Dublin City Council
Dublin Port Tunnel - Alfie Byrne Road	Transroute Tunnel Operations /NRA
Malahide Road N32	National Roads Authority (NRA)
M1 Motorway Crossing	National Roads Authority (NRA)
Santry River Crossing - Malahide Road	Dublin City Council
Mayne River/Cuckoo Stream Crossing - Clonshaugh Road	Fingal County Council

Meetings will be held with the appropriate bodies to discuss and agree proposals for the installation of the pipeline through these areas and communications will continue throughout the project. The agreed approaches will be included in a Method Statement that forms part of the tender documentation with a summary provided in the EIS.

A number of river/stream crossings will require specialised construction techniques. It is envisaged that these crossings will be completed using trenchless technology, comprising the excavation of pits on either side of the crossing and thrust boring underneath the culvert / river bed. Details of each crossing, including launch and reception pits, will be provided in the EIS.

Trial holes will be excavated at three culverted crossings at the Wad and Nanniken River and Kilbarrack Stream with crossing details provided in the EIS.

2.3.2 Above Ground Installations

Above Ground Installations (AGI's) will be required at both Dublin Port and Dublin Airport. These installations will be designed to pump and receive fuel at a maximum pressure of 40 bar and to control and monitor the quality and quantity of fuel being transported. These structures will be constructed inside existing facilities and will therefore not have a significant visual impact.

In Dublin Port the fuel will be transferred from the existing storage tanks to a pumping station via above/below ground piping. The Dublin Port station will be situated in an industrial compound adjacent to the existing oil storage facilities and will consist of:

- Above ground pipe work
- 3 no. pumps
- Metering

- Pig trap
- Control Building (approximately 5 m x 4 m x 3 m high)
- 2.4 m high security fence

The Dublin Airport station will be located adjacent to the existing loading and storage facilities at the airport. The station will be similar in appearance to that at Dublin Port consisting of:

- Above ground pipe work
- Metering
- Pig trap
- Control building (approximately 4 m x 4 m x 3 m high)
- 2.4 m high security fence

2.4 Pipeline Operation

Operation, maintenance and integrity assurance of the pipeline will be carried out in accordance with BS PD 8010 – 1:2004: *Code of Practice for Pipelines Part 1: Steel Pipelines on Land* using proven procedures and systems that the industry currently uses in the UK. Full details of systems proposed will be provided in the EIS.

2.5 Construction Duration

It is anticipated that the construction works will be completed within 10 months. An indicative construction programme will be included in the EIS.

2.5.1 Hours of Work

With respect to construction hours, Condition 5 of the 2001 An Bord Pleanála determination (PL29N.122692) stated that:

> *"All work shall be carried out in accordance with Directions for the Control and Management of Roadwork's in Dublin City" administrated by the Roads Control Unit of the Roads and Traffic Department within Dublin City Council. In this regard, a detailed schedule of working hours and related requirements shall be submitted to the planning authority for agreement prior to commencement of development"*

It is proposed that a similar approach will be taken for this project.

The proposed pipeline route will pass through routes classified as strategic traffic routes, and will be subject to working hour restrictions. To progress the works in an efficient manner and to ensure project viability, discussions will take place with the Local Authorities, to reach agreement on working hours.

The EIS will examine the environmental impacts from a nuisance point of view on the receiving environment if these hours were to be relaxed. The relaxation of the working hours would facilitate acceleration in programme delivery while minimising the duration of any potential nuisance to sensitive receptors along the route.

3 STRUCTURE AND SCOPE OF THE EIS

3.1 Contents of the EIS - Statutory Requirements

The EIS must be prepared in accordance with the Planning and Development Regulations, as amended, which set out the contents of an EIS.

Schedule 6 of the Regulations specifies the information to be contained in an EIS, including the following:

- *"A description of the proposed development comprising information on the site, design and size of the proposed development,*
- *A description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects,*
- *The data required to identify and assess the main effects which the proposed development is likely to have on the environment, and*
- *An outline of the main alternatives studied by the developer and an indication of the main reasons for his or her choice, taking into account the effects on the environment."*

Information is also required on the following matters:

- *"A description of the physical characteristics of the whole proposed development and the land-use requirements during the construction and operational phases,*
- *A description of the main characteristics of the production processes, for instance, nature and quantity of the materials used, and*
- *An estimate, by type and quantity, of expected residues and emissions (including water, air and soil pollution, noise, vibration, light, heat and radiation) resulting from the operation of the proposed development."*

Aspects of the environment likely to be significantly affected by the proposed development are also to be described, including in particular:

- "*Human beings, fauna and flora,*
- *Soil, water, air, climatic factors and the landscape,*
- *Material assets, including the architectural and archaeological heritage, and the cultural heritage, and*
- *The inter-relationship between the above factors*."

A description is required of the likely significant effects (including direct, indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative) of the proposed development on the environment resulting from:

- "*The existence of the proposed development,*
- *The use of natural resources, and*
- *The emission of pollutants, the creation of nuisances and the elimination of waste*"

A description is required of the forecasting methods used to assess the effects on the environment.
A summary in non-technical language of this information is also to be included.

Finally, any difficulties encountered by the developer in compiling the required information should be indicated.

3.2 EIS Methodology

3.2.1 General

The EPA has published guidelines on the preparation of environmental impact statements. These are contained in '*Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)*', published in 2003 and '*Guidelines on the Information to be contained in Environmental Impact Statements*' published in 2002.

With particular relevance to scoping, Section 3.1.2 of the 2002 Guidelines of the latter states "*The prior determination of the nature and detail of the information to be contained in an EIS is one of the most important, yet challenging, stages of the process……and…the difficulty arises from the need to know the likely areas of potential impact and the appropriate methods by which to evaluate them prior to the commencement of detailed data collection or assessment*."

In 2013, the DoECLG published guidelines for local authorities titled Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment. The EIS team will have regard to all of these guidelines in the preparation of the EIS.

The team will also have regard to best practice guidance for individual environmental topics and to applicable sections of the National Roads Authority's publications in relation to the preparation of EIS's for national road projects.

3.2.2 EIS Structure

The structure, which the EIS team proposes to use for this EIS is the grouped format structure.

Using this structure there is a separate chapter for each topic, e.g. air, flora and fauna, soils and geology. The description of the existing environment, the proposed development and the potential impacts, mitigation measures and residual impacts are grouped in the chapter. The grouped format makes it easy to investigate topics of interest and facilitates cross-reference to specialist studies.

Each of the environmental topics will be presented under the following headings:

- Introduction
- Methodology
- Receiving Environment
- Potential Impacts
    - Construction
    - Operation
    - Decommissioning
- Mitigation Measures
    - Construction
    - Operation
    - Decommissioning
- Residual Impacts
- References

4 ENVIRONMENTAL ISSUES TO BE ADDRESSED IN THE EIS

4.1 Background to the Project

The EIS will summarise the strategic need for the pipeline project from an economic and technical perspective.

4.2 EIS Study Area

As previously outlined, the planning corridor for the proposed pipeline will extend from footpath to footpath for sections within the road and 8 m wide for sections through open spaces. The extent of the EIS study area will vary depending on the environmental topic and will generally extend beyond the planning corridor.

4.3 The Need for the Development & Alternatives Considered

The specific need for the proposed development will be outlined along with the 'Do-nothing Scenario'.

The alternatives, which were considered, when selecting the preferred route, will be described under the following headings:

- Health and Safety
- Traffic impact
- Service congestion
- Pipeline length
- Impact on the public
- Proximity to occupied buildings
- Planning/land use
- Impact on wildlife/ habitats and environmentally designated areas
- Impact on archaeology/cultural sites
- Visual impact
- Pipeline construction and operation
- Major road rail and river crossings
- Location of and access to block valves
- Cost and Programme.

Alternative construction methods, design and fuel delivery strategies will also be described.

4.4 Technical Difficulties

Any technical difficulties encountered during the preparation of the EIS will be outlined.

4.5 Scheme Description

A description of all elements of the scheme will be provided including:

- Construction methods and programmes of work
- Commissioning
- Operation and design life
- Monitoring and maintenance of the pipeline
- Emergency controls and response
- Decommissioning.

4.6 Planning and Policy Context

The European, national, regional and local planning and policy context for the project will be addressed with reference to relevant county development and other plans or policies, regional planning guidelines and Government and other policy statements including (but not limited to):

- The National Development Plan 2007 – 2013
- National Spatial Strategy
- Regional Planning Guidelines for the Greater Dublin Area
- Dublin City Development Plan 2011 – 2017
- Fingal County Development Plan 2011 - 2017
- Dublin Airport Local Area Plan
- Dublin Airport Safety Zone - 2011-2017 Development Plan
- Dublin Docklands Area Masterplan
- Greater Dublin Area Transport Strategy 2011 - 2030
- Dublin City Biodiversity Action Plan 2008 - 2012
- Climate Change Strategy for Dublin City 2008 – 2012
- Local Area/Framework Plans

The relevant objectives within each of these documents will be summarised and put in context in relation to the proposed development.

4.7 Consultation Programme

A list will be provided in the EIS of the bodies consulted and a summary will be provided of the concerns expressed and the relevant sections of the EIS in which they are addressed. Copies of correspondence received will be included in the appendices.

4.8 Human Beings – Health and Safety

This section of the EIS will address any potential health and safety impacts of the construction, operation and decommissioning of the pipeline and pumping/receiving station.

4.8.1 Assessment Methodology

This assessment will include details of the construction and operational standards which are in place for a development of this nature. Examples of other similar schemes in operation will be provided.

The type, frequency and responsibilities for the monitoring and maintenance of the pipeline will be outlined. Details on emergency response procedures will be included in an emergency plan. A risk analysis undertaken by AMEC as part of a Safety & Environmental Impact Evaluation will be included. This will include an assessment of the impacts of a leak from the pipeline.

4.8.2 Potential Impacts

Potential impacts may arise in the unlikely event of the failure of the pipeline which could result in contamination of soil, groundwater, surface water etc.

4.9 Human Beings – Socio Economic

The potential impacts from the proposed pipeline project on population trends, employment and the main economic activities of the areas along the route will be addressed in this chapter.

4.9.1 Assessment Methodology

Data from the Central Statistics Office will be used to define the socio-economic baseline. The potential positive and negative impacts of the project on population, employment and economic activity both directly and indirectly, will be assessed.

4.9.2 Receiving Environment

There are a number of neighbourhood services and facilities such as shops, restaurants, bars, etc. along and adjacent to the proposed route as well as larger shopping centres.

4.9.3 Potential Impacts

Temporary disruption may occur to local businesses during the construction phase of the project. As it is proposed to construct the pipeline in a number of sections which will run concurrently, the overall construction programme of the pipeline will be reduced. A traffic management plan will be agreed with the Local Authorities and will focus on limiting traffic disruption and maintaining local access where possible. Once operational there will be no loss of rights of way along the pipeline route.

The project will result in positive impacts such as direct and indirect employment during the construction of the pipeline as well as providing a secure fuel supply to Dublin airport.

4.10 Human Beings – Noise & Vibration

This section of the EIS will address all aspects of noise and vibration associated with each of the phases of the pipeline and receiving/pumping stations.

4.10.1 Assessment Methodology

Baseline noise measurements will be taken as part of the EIS and these will primarily concentrate on the existing night-time noise environment within the residential areas. Baseline measurements will be taken at nine locations along the route in accordance with ISO 1996.

This data will be used to assess the potential impact from night time working. This assessment of the potential noise impacts will be conducted giving consideration to BS5228 *Noise and Vibration Control on Construction and Open Sites*. The methodology and assessment criteria for the assessment of noise impacts from the operational phase of the pumping and receiving stations will be in accordance with the Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4), (EPA 2012).

Noise arising from the HGV movements associated with the proposed construction phase will be assessed using the procedures outlined in the Calculation of Roads Traffic Noise (CRTN) issued by the UK Department of Transport.

4.10.2 Receiving Environment

Existing noise levels with this urban study area are considered to be dominated by the sound of traffic movements as well as industrial sources within the Port and Airport areas.

4.10.3 Potential Impacts

The greatest potential noise and vibration impacts will be during the construction of the pipeline. Therefore, there is potential for short-term, temporary noise level increases. The noise and vibration generated by the construction works will be mainly from the plant and equipment in use during working hours.

However, due to existing elevated noise levels dominated by traffic movement, the potential impact of construction noise over ambient noise is reduced.

During the operational phase, noise emissions will be limited to the operation of the above ground stations at either end of the pipeline. As these stations are located in industrial areas, it is considered that the proposed development will not contribute significantly to the baseline noise levels.

As the route passes in close proximity to residential dwellings, specific noise mitigation measures will be implemented such as a noise management plan. The level of mitigation at sensitive receptors for both noise and vibration, will be assessed as part of the EIS.

4.11 Human Beings – Land Use & Recreation

The assessment will address the potential impacts of the proposed development on land use, residential amenity, recreational facilities and tourism.

4.11.1 Assessment Methodology

The main land uses in the area which could be potentially impacted by the proposed pipeline project will be described using Corine 2006 landcover data and this data will be verified by subsequent walkovers and drive by surveys. Heritage, culture and leisure and recreational facilities along the route will be identified.

An assessment will then be conducted to ascertain any potential impacts that may arise which could directly or indirectly affect land use, a recreational activity or an amenity.

This assessment will be prepared giving cognisance to other disciplines such as noise and vibration, cultural heritage and archaeology, hydrology and ecology.

4.11.2 Receiving Environment

The surrounding land use is predominantly urban and the pipeline passes through or adjacent to a number of residential areas. There are a number of schools and community facilities along or adjacent to the route.

Industrial, enterprise and employment areas are predominantly located at the start and end of the pipeline route in the Dublin Docklands area, East Wall Road and in the Dublin Airport area.

There are a number of public parks namely, Alfie Byrne Open Space, Darndale Park, Moatview Open Space and Belcamp Park, smaller residential green areas and sports grounds as well as larger facilities such as Clontarf Golf course along the route. The northern section of route along Clonshaugh Road is predominantly in an open green countryside area.

4.11.3 Potential Impacts

The proposed pipeline, for the most part, will be routed along public roads which provide access to amenities and sports and recreational facilities. Sections will be located along the eastern boundary of Darndale Park as well as the Athletic Union League- Football Association of Ireland (AUL- FAI) Sports Complex at Clonshaugh.

Small sections of the route will also diverge from the public roadway and will cross under a number of rivers and streams. Four rivers/streams (Tolka, Santry, Mayne and Cuckoo) will be crossed by trenchless techniques. The remaining three (Wad and Nanniken River and Kilbarrack Stream) are culverted. Details of all the crossings will be included in the EIS.

Potential construction impacts include full or partial closure of the access roads to the amenities and sports and recreational facilities, while the pipeline is being installed. There will be disruption to access routes and walking paths, which are adjacent to the rivers and streams being crossed by trenchless means, while the trenchless crossings are being constructed.

The greatest impact on sensitive receptors will be during the construction of the pipeline i.e. from noise, traffic, dust emissions, etc. As the proposed duration of the construction activities will be short term, any impacts will be temporary in nature.

Once the pipeline is operational, the impacts will be related to the requirement for an access and maintenance wayleave through the public park areas and private sports ground. This will lead to sterilisation of the pipeline corridor through these areas. Details will be included in the EIS.

4.12 Human Beings - Roads & Traffic

The traffic impact assessment will address the traffic impacts on the road network from the construction and operation of the pipeline. The assessment will include the supply of materials, plant and equipment and the components of the pumping/receiving stations. Traffic arising from the construction and operation workforce will also be addressed.

4.12.1 Assessment Methodology

The methodology for the traffic impact assessment will include a review of the existing traffic patterns and volumes along affected routes. The traffic generated by the construction workforce and by the transport of materials and equipment will be predicted. The potential disruption to the road network during the installation of the pipeline and the availability of alternative routes will be assessed. Recommendations will be made to mitigate any potential traffic impacts on the local road network and this will include the generation of a Traffic Management Plan for inclusion in the EIS.

This will set out measures to manage both vehicular traffic and pedestrians during the construction works so as to prevent the situation where vehicles are diverted around one work location into the direction of an adjacent work site.

4.12.2 Receiving Environment

The areas along the proposed pipeline route are well served by motorways, national primary and secondary roads which provide good connections to the main port and sources of construction materials. The physical characteristics and standard of the roads are good and have the capacity to accommodate heavy construction traffic.

The route does pass through areas classified as strategic traffic routes which will be subject to working hour restrictions. These include:

- East Wall Road (Category 4)
- Alfie Byrne Road (Category 3)
- Howth Road (Category 3)
- Copeland Avenue (Category 3)
- Clontarf Road (Category 4)
- Malahide Road (Category 5)
- Clonshaugh Road (Category 3)
- R139 (Category 5)

4.12.3 Potential Impacts

While expected to be short-term, there is the potential for significant traffic impacts resulting from the construction of the development. Once operational however, the proposed project will result in the positive elimination of some 20,000 heavy good vehicle movements from the local road infrastructure.

4.13 Air & Climate

4.13.1 Assessment Methodology

The climatic conditions for the proposed pipeline can be represented by meteorological measurements at Dublin Airport synoptic station where the proposed pipeline route terminates. A desk top study will be conducted of air monitoring undertaken by the Environmental Protection Agency (EPA) to determine the baseline environment.

During construction, dust will be emitted from construction areas and there will be exhaust emissions from construction traffic along the proposed route. Although these emissions will be of temporary duration, they will be assessed using the *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* (NRA 2008).

For the purposes of assessing the impact on air quality of emissions generated by construction traffic, the methodology described in the Design Manual for Roads and Bridges 2007a (UK Highways Agency, May 2007) will be used. Parameters to be assessed will include oxides of nitrogen, particulates PM_{10} and $PM_{2.5}$, carbon monoxide and benzene.

Once the proposed pipeline is operational there will be positive impacts on both air quality and climatic conditions through the elimination of some 15,500 heavy good vehicles per year. Traffic emissions are considered a significant source of the greenhouse gas carbon dioxide (CO_2). The DMRB screening model will be used to calculate the greenhouse gas reduction as a result of the pipeline operation.

4.13.2 Receiving Environment

The pipeline route and pumping/receiving stations are located in urban areas, corresponding to air quality Zone A as defined in the S.I. No. 180 of 2011 – Air Quality Standards Regulations.

4.13.3 Potential Impacts

The construction phase of the proposed pipeline has the potential to generate dust emissions, which could give rise to nuisance for local residents. Construction plant and equipment, and the traffic generated by the construction process, have the potential to give rise to emissions of oxides of nitrogen, benzene and particulates, which could impact on local air quality. The operation of the pipeline will not have a negative impact on air quality.

4.14 Flora and Fauna

This chapter of the EIS will address the habitats and species, including those of conservation concern on and in close proximity to the pipeline route, and on and in close proximity to the receiving and pumping stations.

4.14.1 Assessment Methodology

The assessment will focus on:

- Natura 2000 sites i.e. Special Areas of Conservation designated under the EU Habitats Directive (Council Directive 92/43/EEC) and Special Protection Areas designated under the EU Birds Directive (Directive 2009/147 EC), within 15 km of the proposed sites and routes.
- Other designated sites such as Natural Heritage Areas, Nature Reserves and Refuges for Fauna or Flora
- Habitats listed in Annex I of the Habitats Directive
- Birds listed in Annex I of the Birds Directive
- Species protected under the Wildlife Acts including protected flora
- Habitats that can be considered as corridors for the purposes of article 10 of the Habitats Directive
- Red data book species
- And biodiversity in general.

Desk studies will be undertaken in which ecological databases, such as those of the NPWS and EPA will be consulted. The NPWS (including local conservation ranger), Inland Fisheries Ireland and the main environmental non-governmental organisations have been or will be consulted.

A winter bird survey will be conducted at Alfie Byrne, Belcamp and Darndale Parks. This assessment will involve walkover surveys (incorporating walking and vantage point methods across tidal cycles) to sample wintering birds, targeted at species of conservation concern. Surveys will occur 5 times across winter months (November to March).

A flora and fauna assessment of the entire planning corridor was conducted in September 2011, and again on 01 October 2013. This assessment was conducted in accordance with Fossitt (2000) "*A Guide to Habitats in Ireland*", following best practice guidelines in Smith *et al.* (2011) "*Best Practice Guidance for Habitat Survey and Mapping*". The aquatic habitats at the proposed waterbody crossing locations were visually assessed during the flora and fauna survey. The survey also incorporated mammal surveys along the planning corridor. The results of this assessment will be presented in the EIS using GIS mapping.

The entire planning corridor will be assessed for its suitability for roosting and foraging bats, with potential impacts identified and mitigation measures devised.

The route has been chosen to avoid the need for felling trees. However, if during route proofing tree felling is identified as being required, a survey will be conducted by an arboriculturist in accordance with the Arboricultural Association Guidance. The EIS will also set out the minimum separation distance which will be required between the proposed pipeline and existing trees.

The method of crossing the Tolka River will be confirmed prior to submitting the EIS. In the event that trenchless techniques are not feasible at this crossing, an aquatic survey will be conducted at this location during the optimum season (April onwards). It is not proposed to conduct aquatic surveys at the other main crossings (Cuckoo Stream, Mayne and Santry Rivers) given that these are all moderate to poor urban/sub-urban drainage channels.

Details of how environmental seasonal factors and constraints were considered in the overall construction programme will be provided. Mitigation and management practices will be provided on the appropriate handling of invasive species such as the Japanese Knotweed, which is known to occur adjacent to a short section of the northern end of the route. Details of proposed monitoring plans during the construction phase of the project will be provided. Given the nature of the proposed scheme, there will not be a requirement for post-construction monitoring.

The scheme will cross under the River Tolka (albeit there will be no in stream works) and this river flows into the Tolka Estuary at Dublin Bay which is designated an SPA.

4.14.2 Receiving Environment

The proposed pipeline route does not lie within any site that has been designated for nature conservation. It does, however, lie adjacent to the South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay pNHA, Santry Demesne pNHA and Royal Canal pNHA.

For the majority of the route, the pipeline will be laid within the existing public road. The road and adjoining footpaths are all classified as 'Buildings and Artificial Surfaces' habitat. The proposed pipeline route will run along the eastern boundary of Darndale Park. Some sections of tree lines and hedgerows occur along the roadways.

The pipeline route continues up the Clonshaugh road to the Athletic Union Sports Ground where the habitats are amenity grassland with scrub adjoining a dry ditch. A small clump of Japanese Knotweed was noted in the scrub. This was the only place along the route where it was recorded.

With regard to fauna in the environment, the ecological survey undertaken identified a number of high and medium conservation bird species. Two high conservation species were Black-headed Gull *Larus ridibundus* and Herring Gull, *Larus argentatus*. Both species were recorded on the Tolka River.

Five species that are of medium conservation concern were recorded; Brent Goose, *Branta bernicla*, Common Gull, *Larus canus*, House Sparrow, *Passer domesticus*, Mute Swan, *Cygnus olor* and Starling, *Sturnus vulgaris*.

Brent Geese were seen within Fairview Park and in the Tolka estuary. Brent Geese are also known to occur in Belcamp Park. Small remnant populations of Yellowhammers *Emberiza citrinella* and Tree Sparrows *Passer montanus* are also found within Belcamp Park.

4.14.3 Potential Impacts

Potential impacts of the project on flora and fauna include:

- Direct loss of habitat
- Damage to adjacent habitats during construction
- Impacts on water quality due to pollution run-off
- Disturbance to local wildlife, including loss of habitat for, or displacement from, known foraging or breeding areas of mammals etc.
- Damage to or habitat loss of important wildlife corridors or stepping stones during construction
- The introduction of alien invasive species during construction
- Impacts on migratory wildfowl including wintering wildfowl and species such as Brent Geese
- Cumulative impacts which may affect the conservation status of any given species, in particular Annex species such as Whooper Swan
- Impacts on the conservation status of Natura 2000 sites.

Once the pipeline is operational, the potential for negative impacts will be from a pipeline leak in the vicinity of a watercourse or ecologically sensitive area.

4.15 Material Assets - Archaeology, Architecture and Cultural Heritage

The assessment will address features and sites of archaeological, architectural and cultural heritage significance.

4.15.1 Assessment Methodology

An archaeological, architectural and cultural heritage assessment of the previous routes had been conducted and the information gathered from this assessment will be used to inform the survey of the route now proposed. This work will be carried out by Dermot Nelis Archaeology.

The study will involve detailed interrogation of the archaeological and historical background of the proposed development area as well as a walkover survey of the proposed pipeline route. Information will be gathered from the Record of Monuments and Places (RMP) of County Dublin, Topographical Files of the National Museum of Ireland, Dublin City Council and Fingal County Council Development Plans, National Inventory of Architectural Heritage, cartographic and documentary records and aerial photographs of Ordnance Survey Ireland. Reference will also be made to other studies conducted in the area including data collected from the construction of the Dublin Port Tunnel.

An archaeological study corridor of 750 m will be imposed around the proposed development. In addition, the immediate vicinity of the proposed area of land take will be assessed to record the presence of Protected Structures or any additional statutorily protected archaeological, architectural or cultural heritage features recorded in the Dublin City and Fingal Development Plans.

An impact assessment and mitigation strategy will be prepared. This will outline potential adverse impacts that the proposed development may have on the archaeological, architectural or cultural heritage resource, while the mitigation strategy is designed to avoid, reduce or offset such adverse impacts.

Consultation has taken place with a number of bodies including the Heritage Officer, Conservation Officer and Field Monument Advisor of Dublin City Council and Fingal County Council.

4.15.2 Receiving Environment

There is one Recorded Monument (DU018:006, bridge site) within the planning corridor of the proposed development area. This feature no longer survives. There are no Protected Structures within the proposed development area. As a result there will be no direct or indirect construction impact on *in situ* archaeological, architectural or cultural heritage remains.

There are a number of Recorded Monuments and Protected Structures within the immediate environs of the proposed development area. Detail on these will be included in the EIS.

An Architectural Conservation Area is located immediately west of the proposed development area along the western side of Malahide Road.

4.15.3 Potential Impacts

The potential impacts of the pipeline and pumping/receiving stations will be the loss or interference with a site or feature of archaeological, architectural and cultural heritage significance caused by excavations or by construction related vibrations. Where the pipeline passes in the vicinity of a cultural heritage asset, there will also be a risk that construction activities would interfere with views to or from the asset, or obstruct access to the asset, or that the noise from construction activities would alter the ambience of the asset, albeit all on a temporary basis, during construction.

Once the pipeline is operational, the potential for a negative impact on archaeological, architectural and cultural heritage from the development will be minimal.

4.16 Landscape & Visual

4.16.1 Assessment Methodology

A desktop study was undertaken to determine the existing landscape of the area and visual envelope of the proposed pipeline within the area. The patterns and scale of the landscape character including landform, landcover, land use and built development was determined using Ordnance Survey Ireland (OSI) Discovery Series Mapping of the area and available aerial photography of the site.

Landscape values such as amenity areas, designated views and prospects, and historical archaeological and architectural heritage in the vicinity of the proposed pipeline will be identified from the relevant County Development/Area specific plans.

A field assessment of the temporary impacts along the route as well as the permanent impacts of the pumping and receiving stations will be conducted.

4.16.2 Receiving Environment

The Dublin City landscape is of an urban character consisting of individual buildings, streets, urban spaces and neighbourhoods. In the Fingal County Council area, the proposed pipeline passes through the low lying landscape character area and the airport character area. The low lying character area is defined as a mix of pasture and arable farming on level land or land with few views or prospects.

4.16.3 Potential Impacts

The proposed pipeline will give rise to temporary moderate visual intrusion in the immediate vicinity of the pipeline during the period of construction, impacting on the existing character of the area. However, this impact will be short-term in nature.

The long term visual impact of the pipeline following re-instatement will be imperceptible. Above Ground Installations at the pipeline terminals are located within existing industrial compounds and therefore will not alter the existing landscape or visual impact of these areas. These impacts will be discussed in detail in the EIS.

4.17 Hydrology & Water Quality

The assessment will address water quality impacts on surface water. The impact of the project on hydrological features including flood risk will also be addressed.

4.17.1 Assessment Methodology

The assessment will consist of a review of existing baseline data including water quality data from the EPA, River Basin Management Plans and flood risk data from the OPW, the Greater Dublin Strategic Drainage Study and the River Tolka Flood Study. The objectives of the relevant River Basin Management Plans in relation to water quality will be considered. The review will include County Development Plans and consideration of the policies and objectives of each Plan in relation to surface water and flooding. Any concerns expressed by consultees such as Inland Fisheries Ireland and relevant local authorities, relating to hydrology and drainage, will be addressed.

The review will have regard to the baseline data and the studies undertaken for the assessment of impacts on ecology, geology and hydrogeology in relation to environmentally protected areas, receiving waters and soil conditions.

Regard will be given to *The Planning System and Flood Risk Management Guidelines for Planning Authorities*, November 2009 to determine if sections of the route cross indicative floodplains and any identified pluvial areas. Reference will be made to the OPW preliminary flood risk assessment (PFRA) mapping.

The emphasis of this assessment will be on the flood risk to the development, both during construction and operation rather than the flood risk from the development. Issues such as access to the pipe during flooding events and pipeline buoyancy will be addressed. A justification test will be required to assess the appropriateness, or otherwise, of the reasons for development being considered in high flood risk areas. All justification tests will be included in the appendices of the EIS.

Details of each of the river crossings will be provided in the EIS.

4.17.2 Receiving Environment

A review of flood extent mapping available from the OPW website indicates that a number of areas in the vicinity of the proposed pipeline route have experienced flooding.

In accordance with the Water Framework Directive, the current surface water quality status of the Tolka and Santry Rivers is bad and is classified as at risk of failing to achieve good status by 2015 with a date to meet the objectives having been set at 2027. The current status of the Mayne River is poor, and is classified as at risk of failing to achieve good status by 2015. The date to meet the objectives has been set at 2027. These classifications are supported by the biological water monitoring Q rating data which range from Q2-3 to Q3 and the physical/chemical monitoring data available from the EPA, Dublin City Council and Fingal County Council.

4.17.3 Potential Impacts

Potential impacts during the construction phase include:

- Silt run-off from temporary spoil heaps from excavations
- Grout from concreting operations
- Fuel spillages
- Flooding events during construction

There are no potential impacts on flooding anticipated during the operation of the proposed pipeline as there will be no increase in the hard-standing area along the route and as a result, there will be no changes in the hydrodynamics as part of the proposed aviation fuel pipeline. There may however be potential impacts on access to some areas of the pipeline during a flooding event.

The principal potential impact on water quality during the operation of the pipeline is the potential for contamination of surface water features, in the event of a pipeline leak.

4.18 Geology & Hydrogeology

This section will assess the potential impacts on soils, geology and groundwater quality.

4.18.1 Assessment Methodology

The existing geology will be described in terms of the bedrock geology, overburden geology and hydrogeology. It will be prepared using available published literature for the site area which includes:

- Groundwater Protection Scheme for County Dublin (on GSI website www.GSI.ie)
- Geology of Meath - Sheet 13 (MCCONNELL, B et al., 2001)
- Geology of Kildare-Wicklow - Sheet 16 (MCCONNELL, B et al., 1994)
- General Soil Map of Ireland - Second Edition 1980 (GARDINER, M.J and Radford, T, 1980).

The impact assessment section will be prepared having regard to *Geology in Environmental Impact Statements – A Guide* (Institute of Geologists 2002).

An earthworks balance calculation will be prepared for the overall development to assess where excavated material can be beneficially re-used. In addition, an assessment of the volumes of raw material required will be made.

4.18.2 Receiving Environment

The majority of the route is underlain by Carboniferous age limestone and shale of the Lucan Formation. The extreme north of the site, close to Dublin Airport and the area of Kilmore Road, is underlain by calcareous shale and limestone conglomerate of the Carboniferous Tober Colleen Formation, while the extreme south, around Dublin Port, is underlain by the dark grey to black limestone and shale of the Calp Formation.
Soil mapping shows that the pipeline route and surrounding area is underlain predominantly by made ground with minor areas of Grey Brown Podzolic soils, mainly in the north of the study area between Clonshaugh and Dublin Airport. The underlying limestone and shale of the Calp and Lucan Formations is a Locally Important Aquifer (Ll) which is moderately productive in localised zones. The Tober Colleen Formation at Dublin Airport and the Kilmore Road, is classified as a Poor Aquifer (Pl). The bedrock aquifer generally lies within the underlying limestone and shales.

The GSI classifies the groundwater vulnerability of the site as mainly “Low Vulnerability” due to the relatively thick cover of low permeability glacial till in the area. However, part of the pipeline route along Malahide Road is rated as “Moderate”, “High” and “Extreme”, so there is likely to be a reduced overburden cover in this area.

4.18.3 Potential Impacts

The potential impacts from the construction of the proposed pipeline on the soils, geology and groundwater are:

- Degradation and erosion of soil and/or subsoil
- The excavation of made ground or contaminated material
- Contamination of overburden
- Ground movement (impact on roads, footpaths and buildings)

- Increase in groundwater vulnerability
- Impacts from de-watering

During the operation of the proposed development, potential impacts on soils and groundwater will arise in the event that there is a leak from the pipeline.

4.19 Material Assets - Infrastructure

The assessment will address the potential impact on physical infrastructure, such as roads, utilities and other pipelines within the planning corridor of the proposed pipeline route.

4.19.1 Assessment Methodology

All utilities services which have the potential to be impacted by the proposed pipeline will be identified and mapped. A review of relevant published material on the potential for the migration of compounds through PVC and PE pipe walls of other services (such as water mains) in the immediate vicinity of the aviation fuel pipeline will be carried out and included in the EIS.

4.19.2 Receiving Environment

The planning corridor of the proposed pipeline route is served by a network of motorways and national primary routes. Power lines of various voltages cross the route as well as water mains and major sewer schemes (North Dublin drainage scheme and North Fringe sewer). The route also includes high pressure natural gas mains and various telecommunication cables.

4.20 Material Assets - Waste and Resource Use

The assessment will address the use of natural and other resources such as minerals, aggregates, fossil fuels, electricity and water. The impacts arising from the generation and management of waste will also be assessed.

4.20.1 Assessment Methodology

A review will be undertaken of available mineral and aggregate sources. The quantities of these resources, to be consumed in the construction and operation of the pipeline, will be estimated and compared with the available supplies.

A materials mass balance will be prepared for the construction of the scheme with the wastes arising from the construction and operation of the project being detailed.

4.20.2 Potential Impacts

The construction of the pipeline will require quantities of aggregates, fossil fuels, electricity and water. Where feasible, excavated material will be stockpiled at suitable locations and re-used. The estimated total volume of soil to be excavated and removed from site is approximately 8,600 m^3, with a similar volume of granular material being required as backfill.

Small quantities of municipal solid wastes will be generated at the temporary construction compounds. Excavation of any made ground encountered may give rise to spoil requiring disposal. Small quantities of hazardous waste may arise from the clean-up of accidental spillages and the use of oils and hydrocarbons during maintenance activities.

4.21 Cumulative Impacts, Indirect Impacts and Interaction of Effects

The cumulative impacts of the proposed aviation fuel pipeline with other projects, which have received planning permission but have not yet been built, or for which there is information in the public domain, at a sufficient level of detail to allow assessment, will be addressed. Indirect effects and effects in different environmental media will be addressed.

The assessment methodology will be based on the EPA guidance and the EU guidelines, '*Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions*', published by the Office for Official Publications of the European Communities in May 1999.

As part of the scoping exercise, the studies required to assess the impacts of the proposed development in the different environmental media as well as the potential for significant cumulative and indirect impacts and interactions will be examined and any such potential impacts will be identified. Where the potential for significant cumulative and indirect impacts and interactions is identified, such impacts and interaction of impacts will be included in the scope and addressed in the baseline and impact assessment studies for each of the relevant environmental media and aspects of the project. The cumulative and indirect impacts and interaction of impacts will be presented in the chapters of the EIS which address the most relevant environmental media.