

16 Other Impacts, Interactions and Cumulative Effects

16.1 Introduction

This chapter addresses the cumulative impacts, indirect impacts and main interactions between different aspects of the environment likely to be affected by the Douglas Flood Relief Scheme (FRS) (including Togher Culvert). This chapter also addresses environmental effects which have not been specifically addressed in the individual chapters of the EIS.

Only topics which could be logically linked to the development have been examined in detail. Accordingly, when a topic is not mentioned, the authors have concluded that no potential for impact exists.

16.2 Methodology

Reference was made to the EPA Documents, *Guidelines on the information to be contained in Environmental Impact Statements*, EPA 2002, and *Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)*, EPA 2003 (EPA guidelines) in the preparation of this chapter of the EIS.

The EPA has more recently published *Revised Guidelines on the Environmental Impact Statements Draft* (EPA, 2015) and *Advice Notes for Preparing Environmental Impact Statements Draft* (EPA, 2015) and both these documents were referred to in preparing this chapter.

The EU has also prepared 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 (EU guidelines).

At the initial stage in the preparation of the EIS and during the design of the flood defences, the potential for significant cumulative and indirect impacts and interactions was examined and any such potential impacts were identified. Where the potential for significant cumulative and indirect impacts and interactions was identified, such impacts and interaction of impacts were 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 are presented in the chapters of the EIS which address the most relevant environmental media.

The matrix and expert opinion approaches, as outlined in the EU Guidelines, were used in the identification of the potential for significant cumulative and indirect impacts and interactions. Refer to **Table 16.1** for the matrix of potential interactions. Modelling and carrying capacity analyses were used to evaluate impacts.

16.2.1 Definitions

There are no generally agreed and accepted definitions for indirect impacts, cumulative impacts or inter-relationship of impacts. The EPA Guidelines (2002) define cumulative impact thus: *The addition of many smaller impacts to create one larger more significant impact.*

The EPA Guidelines (2002) do not define indirect impacts. The EPA Guidelines use the term synergistic impacts. Synergistic impact is defined as: *Where the resultant impact is of greater significance than the sum of its constituents.*

In 2015, the EPA published draft EIS guidelines, *Revised Guidelines on the Information to be Contained in Environmental Impact Statements.*

The draft EPA Revised Guidelines (2015) define indirect effects as being “*those that arise off site or are caused by other parties that are not under the control of the developer*” and secondary effects as “*those that arise as a consequence of a project.*”

The EU guidelines use slightly different definitions as follows:

Indirect Impacts: Impacts on the environment, which are not a direct result of the project, often produced away from or as a result of a complex pathway (sometimes referred to as second or third level impacts or secondary impacts).

Cumulative Impacts: Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project.

Impact Interactions: The reactions between impacts whether between the impacts of just one project or between the impacts of other projects in the area.

The term ‘impact interactions’ is equivalent to the term ‘inter-relationship of effects’. The EU guidelines accept that their definitions overlap to a certain extent.

The EU guidelines also refer to ‘Cross-Media Impacts’, in which the impact in one environmental medium may also have an indirect impact on another medium

16.3 Effects in Different Environmental Media

16.3.1 Matrix of Effects

Table 16.1 presents the effects matrix. The effects matrix examines the potential for the topic or issue in the left hand column to interact or have an effect on the environmental media listed in the top row of the matrix.

If there is the potential for an effect during the construction phase, this is indicated by a ‘C’. An ‘O’ indicates the potential for an effect during the operational phase and ‘OC’ indicates the potential for an effect during both phases. If there is considered to be no potential for an effect, this is indicated by ‘-’.

The purpose of the effects matrix is to identify potential effects in different media. Actual effects and their significance are dealt with in the most relevant chapter.

Table 16.1: Potential Interaction of Effects Matrix (C = Construction, O = Operational) (These impacts can be positive or negative)

	Noise and Vibration	Air Quality	Hydrology	Climate	Landscape and Visual	Archaeological Architectural & Cultural Heritage	Population and Human Health	Material Assets	Biodiversity	Soils, Geology and Hydrogeology	Roads and Traffic
Noise and Vibration		-	-	-	-	C	C	-	C	-	-
Air Quality	-		-	-	-	-	C	-	C	-	-
Hydrology	-	-		-	-	-	O	O	C	-	-
Landscape and Visual	-	-	-	-		C	CO	-	-	-	-
Archaeological Architectural & Cultural Heritage	-	-	-	-	-		-	-	-	-	-
Population and Human Health	-	-	-	-	-	-		-	-	-	-
Material Assets	-	-	-	-	-	-	CO		-	-	-
Biodiversity	-	-	-	-	-	-	-	-		-	-
Soil, Geology and Hydrogeology	-	-	C	-	CO	-	C	-	C		C
Traffic	C	C	-	C	-	-	C	-	C	-	

16.4 Potential Interactions and Cumulative Impacts

During construction noise and vibration impacts may have a cumulative impact on population and biodiversity, as discussed in **Chapter 8 Population and Human Health** and **Chapter 6 Biodiversity** respectively. Construction vibrational impacts may also potentially impact archaeological, architectural and cultural heritage (**Chapter 13**). Mitigation measures will be implemented to ensure there will be no significant impacts.

The potential impacts from dust and emissions generated during the construction phase on air quality may interact with population and human health (see **Chapter 8**) and biodiversity (see **Chapter 6**). Mitigation measures will be implemented to ensure there will be no significant impacts.

The proposed flood relief works for Douglas and the Togher culvert are designed to alleviate flooding in the area which will by their nature change the local hydrology during a flood event (see **Chapter 12**). These hydrological impacts have the potential to interact with the population (**Chapter 8**) by reducing the flooding risk and material assets (see **Chapter 15**) through the greater flood protection for roads, services and properties during operation of the scheme.

The construction activities will generate visual impacts (**Chapter 7**) and these impacts will interact with human beings (see **Chapters 8**) both during construction and operation once the scheme is built. Mitigation measures will be implemented to ensure there will be no significant impacts.

The proposed flood relief scheme will include works close to or adjacent to some protected structures (such as St Patrick's Mills, mill at Donnybrook) which may potentially result in cumulative visual impacts on the archaeological, architectural and cultural heritage (see **Chapters 7** and **13** respectively). Mitigation measures will be implemented to ensure there will be no significant impacts.

Construction works that require works to the soils and geology may potentially impact the biodiversity (**Chapter 6**), landscape (**Chapter 7**) from the construction flood relief wall and embankments (**Chapter 14**) and people (**Chapter 8**) through the transport of material on and off site. The movement of soil and other material due to the construction works may also have a cumulative impact on the roads and traffic (**Chapter 14**). Mitigation measures will be implemented to ensure there will be no significant impacts.

The construction phase of the drainage scheme will impact the local traffic in the surrounding area (see **Chapter 14**). This construction traffic impact may potentially interact with the local air quality (see **Chapter 10**), noise and vibration from truck movements (**Chapter 9**) and population (**Chapter 8**) due to traffic diversions in the area. Mitigation measures will be put in place during the construction phase to ensure there are no significant effects, refer to **Chapter 4 Construction Activities**.

16.5 References

Directive 97/11EC amending Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment, Official Journal of the European Communities, 1997

Planning and Development Regulations, 2001, Statutory Instrument No 600 of 2001, Government Publications Office, Dublin, 2001

Environmental Protection Agency (2015) *Revised Guidelines on the Information to be contained in the Environmental Impact Statements Draft* EPA, Wexford

Environmental Protection Agency (2015) *Advice Notes for Preparing Environmental Impact Statements Draft* EPA, Wexford

Environmental Protection Agency (2002) *Guidelines on the information to be contained in Environmental Impact Statements* EPA, Wexford

Environmental Protection Agency (2003) *Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)* EPA, Wexford

Office for Official Publications of the European Communities (1999) *Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions*

Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment, Official Journal of the European Economic Communities, 1985.