Chapter 04 – Human Health and Population

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4. HUMAN HEALTH AND POPULATION

4.1 Introduction

This Human Health and Population Impact Assessment has been prepared to assess the likely significant effects on human health and population in respect of the Proposed Development.

The EU (2017) *Guidance on the preparation of the Environmental Impact Assessment Report* outlines that human health is a very broad factor that is be highly project dependent. This guidance states:

The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the project, effects caused by changes in disease vectors caused by the project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study.

Human health should be considered in the context of environmental pathways which may affect health such as air quality, noise, water and soil quality. All can contribute to negative effects on human health by facilitating the transport of contaminants or pollutants. An evaluation of the effects of these pathways on health, by considering the accepted standards of safety in dose, exposure or risk of air quality and noise levels for example, is considered appropriate, as these standards have been arrived at via scientific and medical research.

The EPA '*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*' (EPA, 2022) notes that the transposing legislation does not require assessment of land-use planning, demographic issues, or detailed socioeconomic analysis (EPA, 2022).

Furthermore, in accordance with the EPA Guidelines (EPA, 2022), the assessment of impacts on population and human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in the Environmental Impact Assessment Report (EIAR). The likely significant impacts on Human Health and Population regarding issues such as soils, geology and hydrogeology, water, air quality, noise and vibration, traffic and landscape are addressed in detail within the following EIAR chapters:

- Chapter 5 – Land, Soils, and Geology;
- Chapter 6 – Hydrology and Hydrogeology;
- Chapter 8 – Air Quality;
- Chapter 10 – Noise and Vibration;
- Chapter 11 – Landscape and Visual; and
- Chapter 13 – Material Assets - Traffic and Transportation.

Where these topics are dealt with in further detail elsewhere in this EIAR, the relevant chapters have been cross referenced in this Chapter to provide the Competent Authority with a context for their determination.

The assessment of other health and safety issues that are carried out under other EU Directives are also relevant. These may include reports prepared under the Industrial Emissions, Waste Framework, Landfill, Strategic Environmental Assessment, Seveso III, Water Framework Directive, Floods or Nuclear Safety Directives. In keeping with the requirement of the amended EIA Directive, an EIAR considers the results of such assessments without duplicating them.

4.2 Methodology

4.2.1 Relevant Legislation and Guidance

This chapter has been prepared in accordance with:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports. Environment Protection Agency (EPA, 2022).
- Health Impact Assessment Guidance. Institute of Public Health (IPH), (IPH, 2021).
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report European Commission (EU, 2017).

This chapter follows these guidelines and will examine the health effects relevant to the Proposed Development as they relate to the relevant study area.

The description of the sensitivity, magnitude and significance, outlined within this assessment are based on the Health Impact Assessment Guidance (IPH, 2021) criteria, while the probability and duration of effects are based on the definitions set out within Section 3.7 of the 'Guidelines on information to be contained in Environmental Impact Assessment Reports' (EPA, 2022).

4.2.2 Data Sources of information

The following sources of information have been used in this assessment:

- 2022 Census results carried out by the Central Statistics Office (CSO) 03 April 2022. Made available from https://www.cso.ie/en/
- 2016 Census carried out by the Central Statistics Office (CSO) 24 April 2016. Made available from https://www.cso.ie/en/
- Pobal HP Deprivation Index based on 2022 Census Data (CSO) Made available from https://www.pobal.ie/
- Pobal HP Deprivation Index based on 2016 Census Data (CSO) Made available from https://www.pobal.ie/
- Google maps available from https://www.google.com/maps
- OpenStreetMap and contributors available from https://www.openstreetmap.org
- Health and Safety Authority (HSA) online register of Notified Seveso Establishments available from https://www.hsa.ie/eng/your_industry/chemicals/legislation_enforcement/comah/list_of_establishments/.

4.2.3 Study Area

There is no specific guidance available on an appropriate study area to focus the assessment of existing land use and/or permitted projects. The research area has been established using expert judgement and based on the accessibility of data and taking into consideration the potential for impact from the Proposed Development.

It is acknowledged that projects like the one proposed can have an impact on activity in a larger area than only the site itself. Generally, the closer to the works, the greater the potential for impacts. Based on our professional experience with similar developments, and the sensitivity of the surrounding source-pathway-receptor human baseline, the majority of the potential environmental impacts are likely to be confined within 50-150 m of the Proposed Development. Some effects from the Proposed Development, including air quality and traffic, might have a larger area of effect, and these are addressed in further detail in the corresponding expert assessments that are set out in the other chapters within this EIAR.

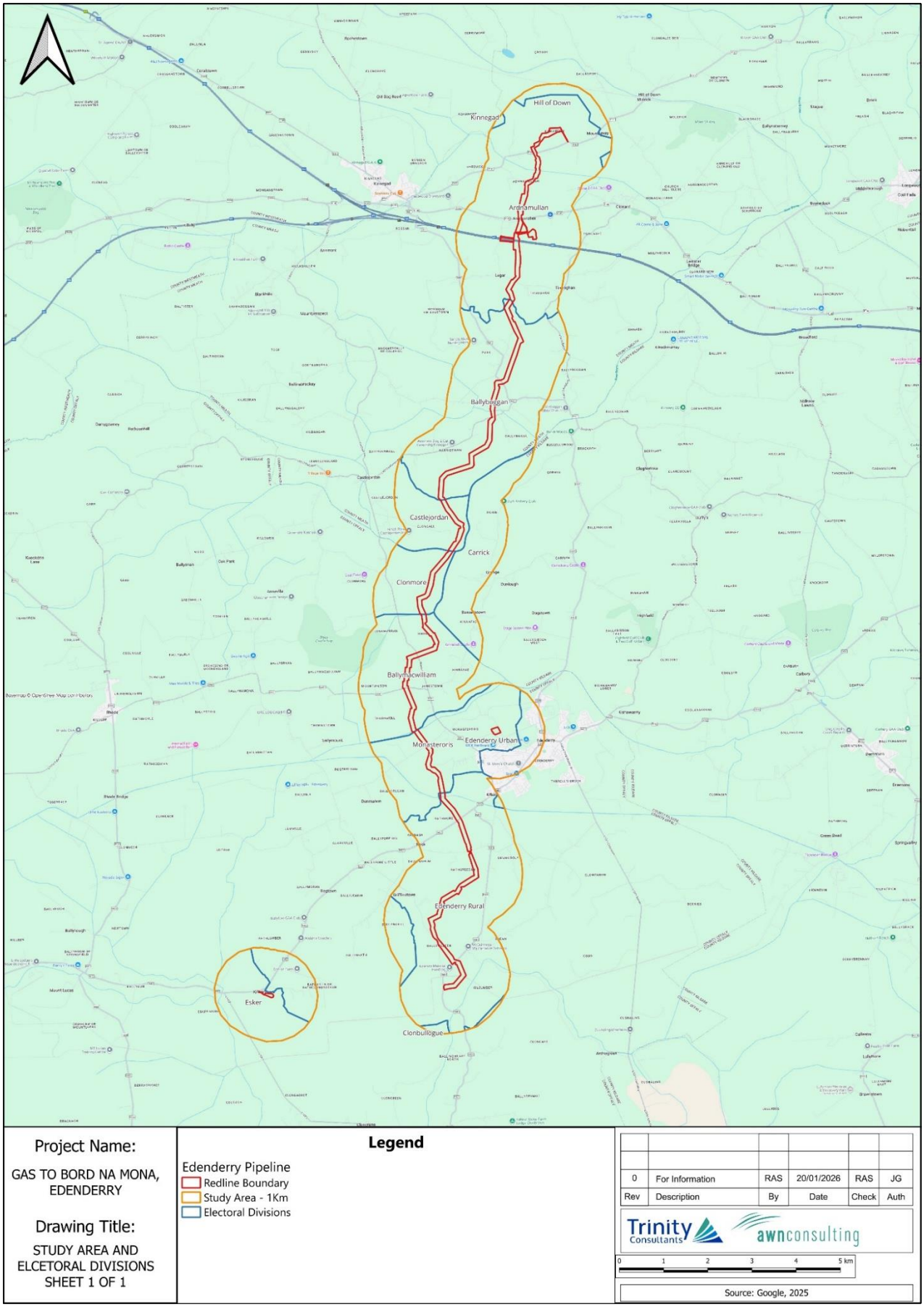
The Proposed Development being considered, is not expected to have Regional, National or International, or Transboundary impacts on Human Health. Therefore, the study area has been restricted to the

neighbouring community (site-specific population), and wider community (local population). A general study area of 1 km from the site location is included for population statistics, and a radius of 1 km from the site location has been used to inform the baseline description of the area. The 1 km study area used for population statistics and baseline description is shown in Figure 4-1 below.

In the desk-based assessment of Population Health Sensitivity the use of Electoral Divisions (ED) statistics from CSO have been utilised. Electoral Divisions are the smallest legally defined administrative areas in the state; developed with the intention of producing areas roughly equivalent in both population and "rateable value" (CSO).

The Proposed Development site is situated within the administrative areas of Meath County Council (MCC) and Offaly County Council (OCC), spanning a total of 13 no. Electoral Divisions (EDs). The EDs located in County Meath include Ardnamullan (167005), Ballyboggan (167008), Castlejordan (167015), Hill of Down (167036) and Kinnegad (237068). In County Offaly, the site crosses Clonmore (187022), Ballymacwilliam (187007), Monasteroris (187063), Edenderry Rural (187035), Edenderry Urban (187036), Clonbulloge (187020), and Esker (187038/187002). The study area also includes Carrick (087020) in County Kildare.

Figure 4-1 Study Area (1 km)

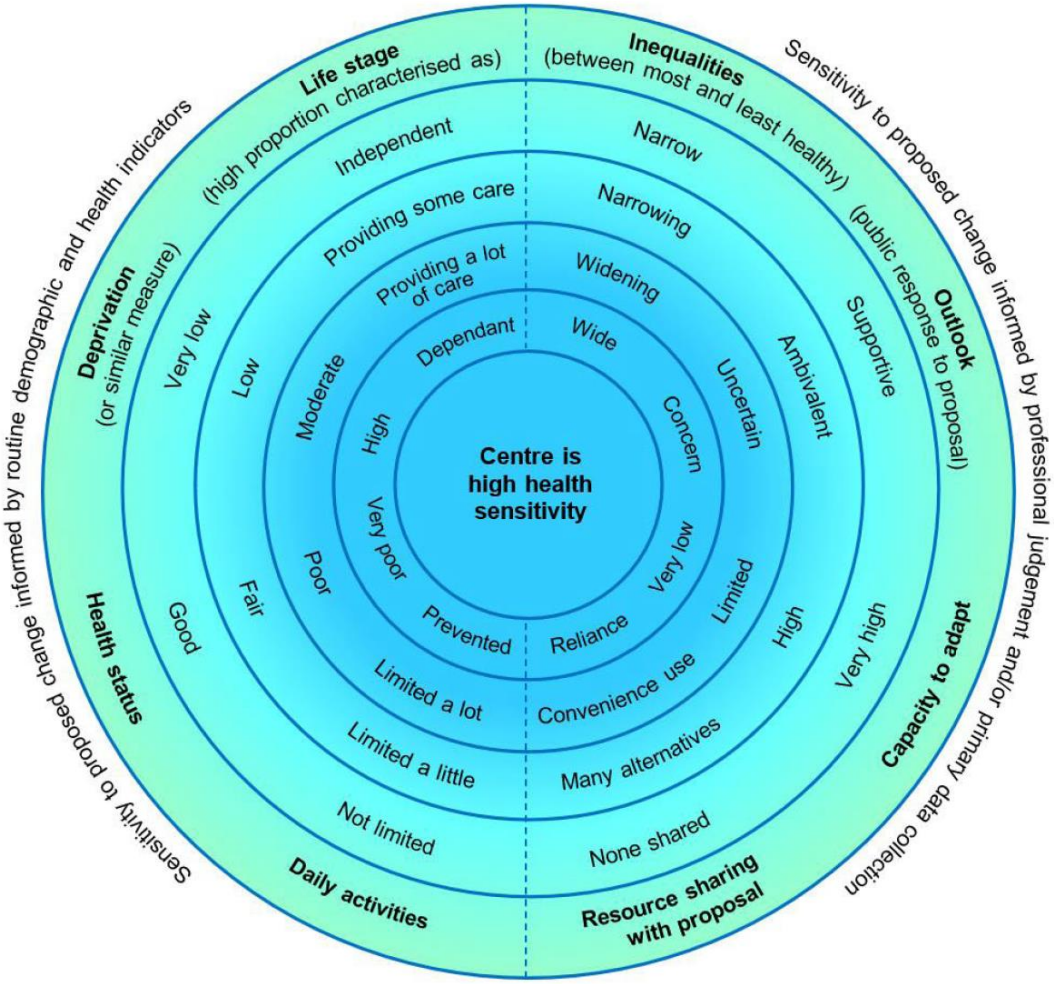


4.2.4 Population Impact Assessment Categories

The assessment of significance of an impact is a professional appraisal based on the sensitivity of the receptor and the magnitude of effect. Within any area, the sensitivity of individuals in a population will vary. The Health Impact Assessment Guidance (IPH, 2021) sets out conceptual model of the different components of sensitivity (Insert 4-1). It uses criteria (segments) and indicative classifications (levels) to explore, and explain, a finding of sensitivity. The conclusion may be summarised as a high, medium, low or negligible sensitivity to change.

The existing sensitivity of the receiving environment (in terms of population and human health) has been appraised for the study area with a desk-based assessment of routine demographic and health indicators, rather than the use of surveys or collection of primary data. This includes analysis of existing data (based on the availably of information) from the Central Statistics Office (CSO) and Pobal to build up a profile of the baseline population information within the study area. Topographical maps and Google maps have also been used to inform the baseline description of the area to inform the proximity of the site to areas of economic activity, employment, community infrastructure, emergency services, tourism and recreation amenities.

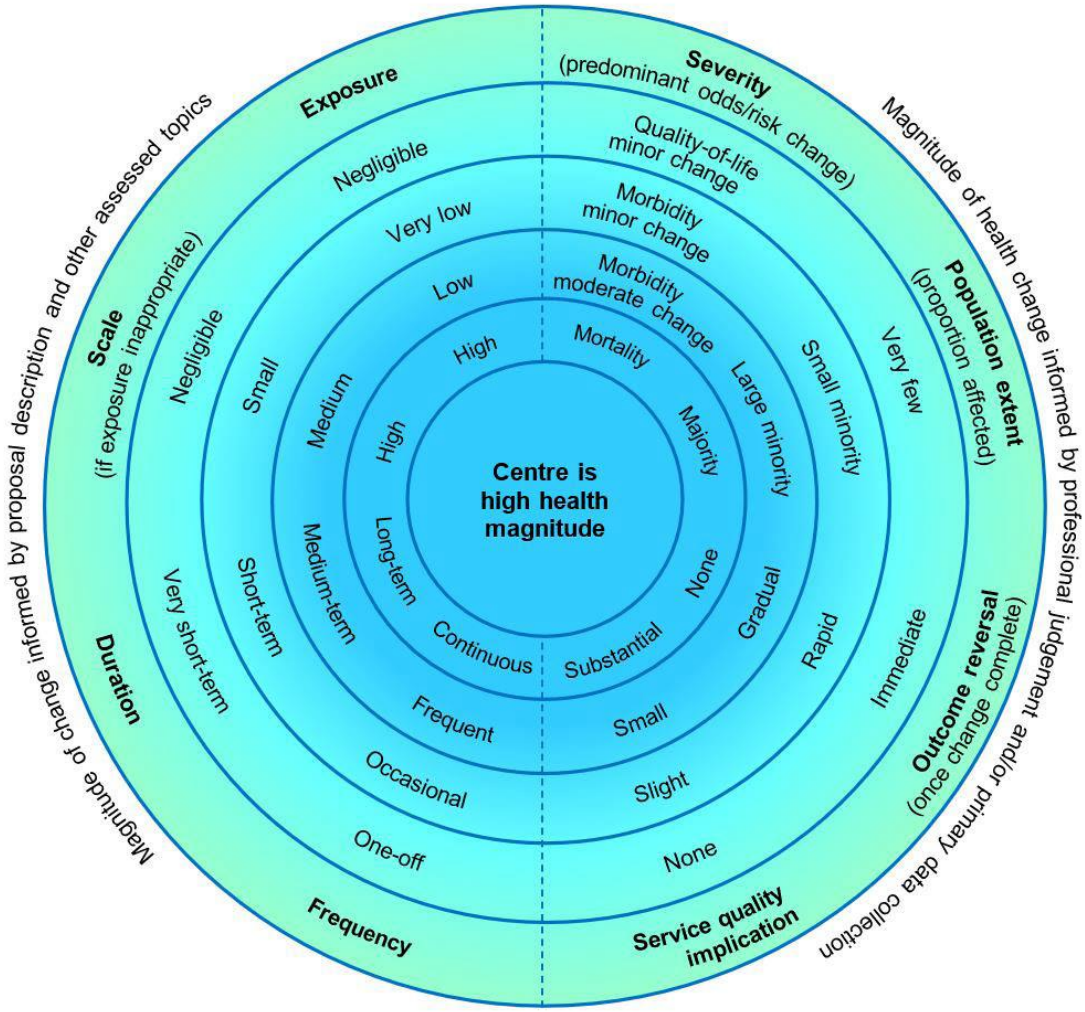
Insert 4-1 Health sensitivity: conceptual model (Source: Health Impact Assessment Guidance (IPH, 2021))



4.2.4.1 Magnitude of Impact

Magnitude considers the characteristics of the change which would affect the receptor as a result of the proposal. The Health Impact Assessment Guidance (IPH, 2021) sets out a conceptual model of the different components of sensitivity (Insert 4-2). Again, this model provides different components of *magnitude*. It uses criteria (segments) and indicative classifications (levels) to explore, and explain, a finding of *magnitude*. The conclusion may be summarised as a high, medium, low or negligible magnitude of change.

Insert 4-2 Health magnitude: conceptual model (Source: Health Impact Assessment Guidance (IPH, 2021))



4.2.4.2 Significance of Effects

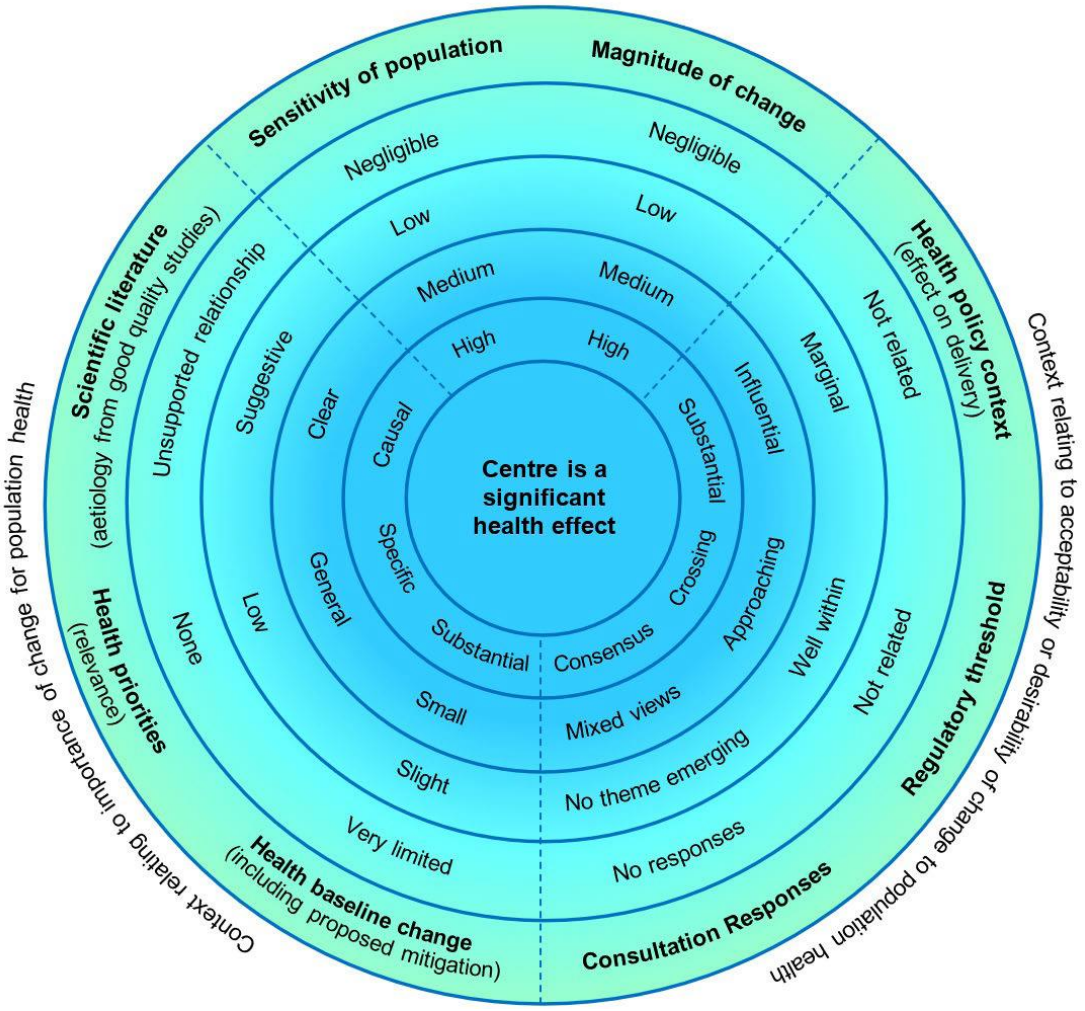
Significance relies on informed, expert judgement about what is important, desirable or acceptable with regards to changes triggered by the proposal in question. The assessment of the significance of effects in this assessment is a professional appraisal and has been based on the relationship between the magnitude of the effects and the sensitivity of the receptor.

The Health Impact Assessment Guidance (IPH, 2021) sets out a conceptual model of the different components of significance. It uses criteria (segments) and indicative classifications (levels) to explore, and explain, a finding that a health effect is significant or not significant.

The Health Impact Assessment Guidance (IPH, 2021) model brings together different types of evidence, e.g. scientific literature, public health priorities, regulatory standards and health policy. The model thus not only take into account a range of evidence sources, but also a diversity of professional perspectives, e.g. academics, public health practitioners, regulators and policy makers.

The model below, includes the factors of magnitude of impact and the sensitivity of receptors as determined in Section 4.2.1 and Section 4.2.2 above. This EIA assessment typically relies on regulatory thresholds, where there would be formal monitoring by regulators, to set out the acceptability or desirability of change to population health.

Insert 4-3 Health significance: conceptual model (Source: Health Impact Assessment Guidance (IPH, 2021))



4.2.5 Forecasting Methods and Difficulties Encountered

No specific difficulties were encountered in preparing the population and human health assessment. However, as with all EIARs, there are inherent limitations and uncertainties associated with forecasting potential effects on human health.

Assessing potential impacts on individuals or communities can be challenging due to the absence of individual level health data and the fact that baseline health information is typically available only at aggregated geographical scales (e.g. Electoral Division). Predicting future health outcomes must therefore

rely on recognised guidance, and reasonable assumptions about how environmental pathways (air quality, noise, traffic, water quality, etc.) may interact with sensitive human receptors.

Human health impacts arising from the Proposed Development are assessed by drawing on the methodologies and modelling outputs presented in the relevant specialist chapters of this EIAR. These chapters provide the quantitative and qualitative assessments for the human health evaluation. Where forecasting methods have been used—such as modelling, prediction, or forecasting—the relevant methodologies and assumptions are described in detail within each specialist chapter.

4.3 Receiving Environment

4.3.1 Population Health Sensitivity within the Study Area

The purpose of the population health sensitivity assessment is to identify the likely sensitivity of the local population and its capacity to absorb change. For this assessment, it is considered that available data on population, deprivation, life stage and health status within the Study Area provides sufficient information to establish population sensitivity and to provide the Competent Authority with context. These datasets reflect the main factors that influence how a population may be affected by change and are consistent with commonly used indicators in health and environmental assessments. Based on professional judgement, they are appropriate and proportionate to the scale and nature of the Proposed Development.

4.3.1.1 Population

The most recent census of population was carried out by the CSO on the 3rd of April 2022. The census compiles data for the whole state as well as smaller individual areas including counties, cities, towns, and electoral divisions. Taking into consideration the location of the Proposed Development, the census information on population, age profile, employment, and social class, has been analysed in relation to the development site.

Table 4-1 presents the population change for the State and for the Electoral Divisions (EDs) within the Study Area between the 2016 and 2022 census years. The most recent census data (2022) shows that all 13 no. EDs recorded population growth during this period. Notably, the growth rates in the EDs of Kinnegad, Clonmore, Monasteroris, Edenderry Urban, and Edenderry Rural were higher than the national average for the Republic of Ireland.

Table 4-1 Population Change at National, County and Electoral Division Level from 2016 – 2022 (Source: www.cso.ie)

Area	Population for Census Year		% Change 2016-2022
	2016	2022	
State - Republic of Ireland	4,761,865	5,149,139	+8.1%
Hill of Down	550	583	+6.0%
Kinnegad	2,915	3,245	+11.32%
Ardnamullan	864	877	+1.51%
Ballyboggan	528	567	+7.39%
Castlejordan	427	440	+3.05%
Carrick	290	304	+4.82%
Clonmore	433	508	+17.32%
Ballymacwilliam	636	652	+2.52%
Monasteroris	806	892	+10.67%

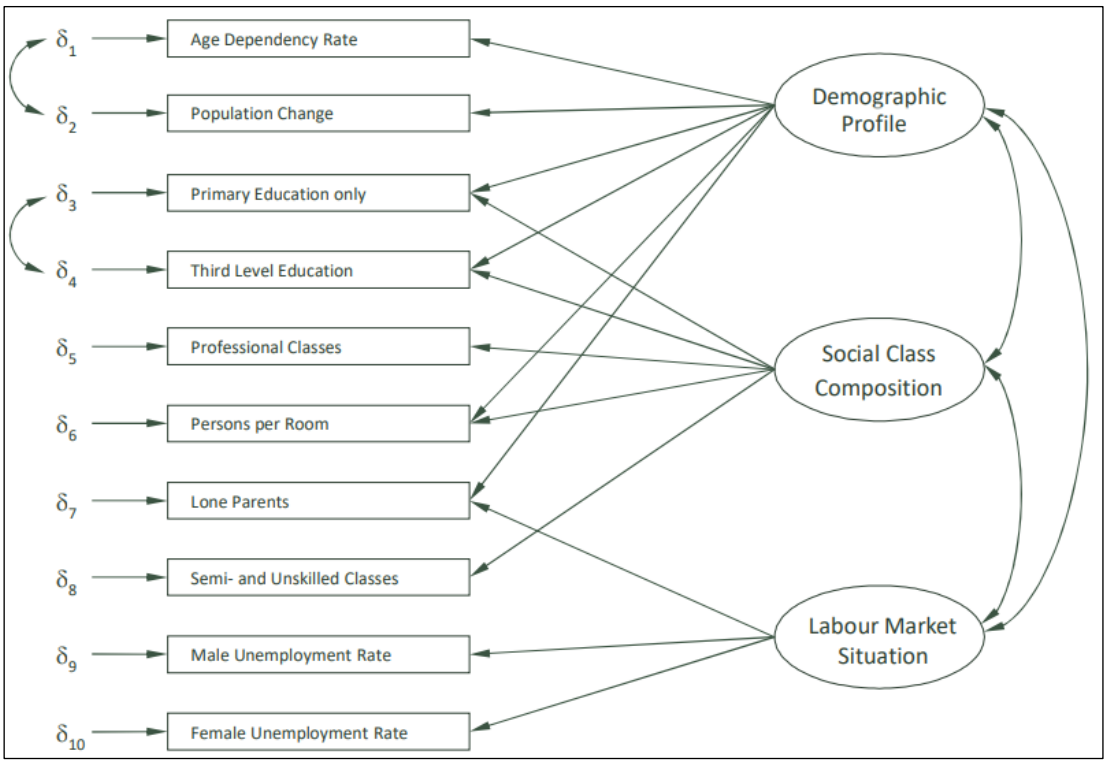
Edenderry Urban	7,001	7,612	+8.73%
Edenderry Rural	816	890	+9.07%
Clonbullogue	772	825	+6.87%
Esker	474	495	+4.43%

4.3.1.2 Deprivation

The Health Impact Assessment Guidance (IPH, 2021) outlines that impact assessments should consider if the population is already stressed by limited resources or high burdens as well as if groups are affected that have reduced access to financial, social and political resources. Deprivation differences between areas are indicative of social gradients, which are central to the consideration of health inequalities.

Deprivation statistics for Ireland are available from the Pobal HP Deprivation Index that shows the overall affluence and deprivation. This Index draws on data from the national Census and combines three dimensions of relative affluence and deprivation: Demographic Profile, Social Class Composition and Labour Market Situation that are measured by ten key socio-economic indicators from the Census of Population.

Insert 4-4 Basic Model of the Pobal HP Deprivation Index



The Pobal HP Deprivation Index Relative Index Score allows for the provision of descriptive labels with the scores, which are grouped by standard deviation as seen in Table 4-2 below.

In order to make a uniform assessment using the conceptual model as set out in Insert 4-4 above a relative Population Sensitivity is used - the Deprivation Score of 'Very disadvantaged', or 'Extremely disadvantaged' would represent a high sensitivity. Conversely, a 'Extremely affluent' or 'Very affluent' would represent a very low sensitivity.

Table 4-2 Pobal HP Index Relevant Index Score labels (Source: Pobal HP Deprivation Index)

Deprivation Score	Pobal HP Description	Sensitivity of Population
> 30	Extremely affluent	Very Low
20 to 30	Very affluent	Very Low
10 to 20	Affluent	Low
0 to 10	Marginally above average	Low
0 to -10	Marginally below average	Moderate
-10 to -20	Disadvantaged	Moderate
-20 to -30	Very disadvantaged	High
< -30	Extremely disadvantaged	High

The data in Table 4-3 present the Pobal HP Deprivation Index scores for the Study Area, based on the 2022 Census. As Pobal has not yet released national-level deprivation scores for 2022, the county-level scores for Meath and Offaly have been used for comparison. The Deprivation Index indicates that, in 2022, all five EDs in County Meath were classified as 'Marginally Below Average', compared with the county's overall 'Marginally Above Average' score. Carrick ED was classified as Marginally Above Average, which is consistent with the overall County Kildare score. In County Offaly, five of the seven EDs were classified as 'Marginally Below Average', which aligns with the overall County Offaly score. Overall, this suggests a low to moderate level of population sensitivity (deprivation) within the Study Area.

Table 4-3 Deprivation Score within the Study Area (Pobal HP Deprivation Index, 2022 Census)

Area	Deprivation Score	Pobal HP Description
County Meath	*1.56*	*Marginally Above Average*
Hill of Down	-2.79	Marginally Below Average
Kinnegad	-1.69	Marginally Below Average
Ardnamullan	-2.37	Marginally Below Average
Ballyboggan	-2.89	Marginally Below Average
Castlejordan	-7.29	Marginally Below Average
County Kildare	*3.11*	*Marginally Above Average*
Carrick	2.73	Marginally Above Average
County Offaly	*-4.58*	*Marginally Below Average*
Clonmore	-2.32	Marginally Below Average
Ballymacwilliam	-1.04	Marginally Below Average
Monasteroris	0.71	Marginally Above Average
Edenderry Urban	-9.10	Marginally Below Average
Edenderry Rural	-0.49	Marginally Below Average
Clonbulloge	-6.68	Marginally Below Average
Esker	2.35	Marginally Above Average

4.3.1.3 Life Stage (Age Dependency)

The Health Impact Assessment Guidance (IPH, 2021) outlines that life-course analysis is often used in public health and reflects differing health sensitivities and needs at different ages. Typically, children and

older people are particularly sensitive to change, including due to being dependants. Dependents are defined for statistical purposes as people outside the normal working age of 15-64. Dependency ratios are used to give a useful indication of the age structure of a population with young (0-14) and old (65+) shown as a percentage of the population of working age (15-64).

A low dependency ratio indicates that there is a larger proportion of working population age (15–64) years as compared to young (0-14) and old (65+). Conversely, a high dependency ratio indicates that there is a larger proportion of young (0-14) and old (65+) as compared to working population age. High dependency ratio can also indicate if some groups are more likely to be at home during the day (for example, due to childcare, or retired persons) and would therefore be more likely to be impacted by a development within the area.

Age dependency ratio is available through the Pobal Online Geo-Profiling tools (https://maps.pobal.ie/) which are based on the national Census.

The age dependency ratio for the study area is shown in Table 4-4 below. These dependency ratios demonstrate that the Study Area is less dependent when compared with the national average. This indicates a largely 'independent' Study Area as compared with ROI, which can be defined as per the conceptual model shown in Insert 4-1 as 'providing some care' to 'providing a lot of care'. This indicates that there is a larger proportion of working population within the Study Area, likely to be more mobile, and out of the home during the day, and would therefore be less likely to be impacted by a development within the area as compared to a more dependant population.

Table 4-4 Age Dependency Ratio within the Study Area (Pobal Geo-Profiling, 2022 Census)

Area	Age Dependency Ratio for Census Year (%)	
	2016	2022
State - Republic of Ireland	52.70	53.22
Hill of Down	36.75	38.25
Kinnegad	35.75	30.26
Ardnamullan	34.62	31.93
Ballyboggan	39.77	38.45
Castlejordan	34.46	34.77
Carrick	38.28	29.93
Clonmore	40.31	38.19
Ballymacwilliam	35.70	32.82
Monasteroris	33.62	34.64
Edenderry Urban	34.47	32.70
Edenderry Rural	36.67	33.60
Clonbulloge	38.61	34.30
Esker	37.76	39.39

4.3.1.4 Health Status (General Health)

The CSO as part of the census records an overall self-reported measure of population health within Ireland. Areas with a poor health status are typically considered to be of a higher sensitivity and more susceptible to change in environmental conditions.

Table 4-5 below shows the self-reported measure of population health within the Study Area compared to ROI. This shows the area predominately self-reports their health as 'Very Good', which is in-line with national trends.

Table 4-5 Self-reported Measure of Population Health (CSO, 2022 Census)

Area	% population describing their general health					
	Not Stated	Very Bad	Bad	Fair	Good	Very Good
State - Republic of Ireland	6.74%	0.32%	1.41%	8.64%	29.66%	53.23%
Hill of Down	7.03%	0.69%	1.37%	7.03%	27.27%	56.60%
Kinnegad	6.87%	0.12%	1.48%	9.12%	30.57%	51.83%
Ardnamullan	7.3%	0.23%	1.71%	8.67%	29.55%	52.52%
Ballyboggan	12.7%	0.18%	0.41%	7.23%	25.92%	52.56%
Castlejordan	3.18%	0.23%	0.46%	10.23%	31.82%	54.09%
Carrick	5.92%	0.00%	0.33%	8.55%	30.92%	54.28%
Clonmore	9.06%	0.0%	1.38%	9.45%	27.95%	52.17%
Ballymacwilliam	2.76%	0.46%	1.69%	7.67%	29.45%	57.98%
Monasteroris	5.27%	0.34%	2.02%	8.52%	29.80%	54.03%
Edenderry Urban	7.69%	0.42%	2.05%	10.40%	33.91%	45.53%
Edenderry Rural	15.51%	0.23%	1.69%	8.54%	27.98%	46.07%
Clonbulloge	12.12%	0.36%	0.97%	9.70%	28.73%	48.12%
Esker	4.64%	0.20%	1.01%	13.33%	20.97%	59.80%

4.3.1.5 Ability to Perform Daily Activities

People's ability to perform day-to-day activities is relevant to population sensitivity, particularly where there are changes in access to services or community amenities. Persons with disabilities can also be more susceptible to the changes in environmental conditions. The CSO as part of the census records an overall self-reported measure of persons with disabilities within Ireland.

Table 4-6 details the number of persons with a disability compared to the population as a whole. The data shows that five of the thirteen EDs within the study area have a higher % of Persons with a disability than the national average, indicating that for persons within these areas there are greater restrictions on daily activity than the national average. Overall, across the study area as a whole, there are still relatively limited restrictions on daily activity.

Table 4-6 Persons with a disability (CSO, 2022 Census)

Area	Persons with a disability	Population	% Persons with a disability
State - Republic of Ireland	1,109,557	5,149,139	21.5%
Hill of Down	119	583	20.4%
Kinnegad	709	3,245	21.8%
Ardnamullan	196	877	22.4%
Ballyboggan	93	567	16.4%
Castlejordan	103	440	23.4%

Carrick	60	304	19.7%
Clonmore	119	508	23.4%
Ballymacwilliam	138	652	21.2%
Monasteroris	185	892	20.7%
Edenderry Urban	1,656	7,612	21.8%
Edenderry Rural	167	890	18.8%
Clonbulloge	174	825	21.1%
Esker	92	495	18.6%

4.3.1.6 Summary of Population Health Sensitivity

The 2022 Census data indicate that all thirteen EDs within the Study Area recorded population growth between 2016 and 2022. Notably, the growth rates in the EDs of Kinnegad, Clonmore, Monasteroris, Edenderry Urban, and Edenderry Rural were higher than the national average for the Republic of Ireland. The remaining eight EDs had lower growth rates than the national average, reflecting overall population stability within the Study Area.

The Pobal HP Deprivation Index shows that, in 2022, all five EDs in County Meath were classified as 'Marginally Below Average', compared with the county's overall 'Marginally Above Average' score. In County Offaly, five of the seven EDs were classified as 'Marginally Below Average', which aligns with the overall County Offaly score. Carrick ED in County Kildare was classified as 'Marginally Above Average,' aligning with the overall County Kildare score. Overall, this suggests a low to moderate level of population sensitivity in terms of deprivation.

Health data for the Study Area show that a high proportion of the population (45.53%–59.80%) reported their health status as 'Very Good', with a low proportion reporting 'Bad' or 'Very Bad' health. However, five of the thirteen EDs have a higher percentage of persons with a disability than the national average, indicating somewhat greater restrictions on daily activity in these areas. Nonetheless, since most EDs in the Study Area record a lower percentage of persons with a disability than the national average, this suggests relatively limited overall restrictions on daily activity across the Study Area.

Taking these factors into account, the population within the Study Area demonstrates a low to moderate sensitivity to change. In accordance with the criteria outlined in Insert 4-1, the Study Area is therefore assessed as having **Low to Moderate** Population Sensitivity.

4.3.2 Location and Character of the Local Environment

The purpose of describing the location and character of the local environment provides useful information on the current local community and usage within the study area provide the Competent Authority with a context for this assessment. This includes community and social infrastructure that covers a range of services and facilities that meet local and strategic needs and contribute towards a good quality of life. In this context it includes local business, residential areas, education, health facilities, emergency services, and places of worship, and green infrastructure.

Furthermore, the baseline identifies tourism and landscape amenity within the study Area which provides an indication on current intrinsic values placed on the area for local, national and international users that may be impacted by the Proposed Development.

The local environment also includes areas of natural resources that relate to populations and human health that may be impacted by the Proposed Development, this includes economic resources, recreational and bathing waters, and drinking water resources.

A general study area comprising EDs within 1 km of the site location has been used for both the population statistics and the baseline description of the area. Refer to Figure 4-1 in Section 4.2.3 for the baseline area map.

4.3.2.1 Community and Social Infrastructure within the Study Area

The site is located within the jurisdictions of both Meath and Offaly Counties. Zoning designations have been reviewed in accordance with the current County Development Plans.

Under the Meath County Development Plan 2021–2027, the proposed underground transmission gas pipeline traverses an area designated as 'Rural Area – RA'. The objective of this designation is "to protect and promote, in a balanced way, the development of agriculture, forestry and rural-related enterprise, biodiversity, the rural landscape, and the built and cultural heritage." *Sustainable Energy Installations* and *Utility Structures* are types of development that are permitted in principle under this zoning.

Under the Offaly County Development Plan 2021–2027, the Proposed Development site passes through agricultural land that has no specific zoning designation.

Residential and Employment area

The Proposed Development site is situated within a predominantly rural area characterised by an agricultural landscape with dispersed residential dwellings. With exception of Edenderry, the surrounding landscape consists mainly of single-family homes and farms that reflect the area's strong agricultural character. These residences are scattered throughout the countryside, contributing to a low-density rural living environment.

Edenderry Town lies to the east of the proposed pipeline corridor and is situated in close proximity to the proposed Temporary Construction Compound 03. As the largest urban centre within the study area, Edenderry contains the highest concentration of dense residential neighbourhoods within 1km radius, along with a mix of community services and employment uses.

The closest shopping area located within the Study Area of the Proposed Development site is Edenderry shopping centre, located c. 0.6km south-east from the proposed Temporary Construction Compound 03. There are also two Spars within the study area, c. 0.9km and 1.1km southeast and c. 1.92 km east of the proposed Temporary Construction Compound 03.

There are no industrial facilities within the Study Area, and only a small number of commercial businesses are located within the proposed 1km radius, the majority of which are concentrated in Edenderry Town. The existing commercial facilities within the Study Area and their approximate distances from the site boundary are as follows:

- Taggarts Airfield (recreational airfield) – c. 0.3km east
- Iron Torque Garage Mechanic – c. 1km east
- Woofters Cat & Dog Grooming Kinnegad – 0.4 north-west
- Hinch Plant Castlejordan Pit (Manufacturer) – c. 1km west
- Caitriona O'Meara -Equine Training Solutions – c. 1 km east
- National electrical wholesalers – c. 0.3km west
- Rationel windows & doors Ireland limited – c. 0.3km north-west
- Edenderrry Business Campus – c. 0.25km west / southwest
- Kearney Material handling – c. 0.2km west
- McGuiness Maintenance Services (Sewage Disposal Services) – c. 0.4m north-east
- O'Grady Crane Hire & Transport – c. 0.35km west
- MCK Hardware – c. 0.3km south
- Total Stationery Supplies Limited – c. 0.85km south-east
- Irish Planning & Extensions - Architectural designer – c. 0.9km south

- Mazurek Grocery Shop – c. 0.85km south-east
- EK Tyres - Tire shop – c. 0.9km east

Education, Childcare, Schools

There are a few childcare facilities or schools within the Study Area:

- Oaklands Community College – c. 0.9km south-east
- Gaelscoil Éadan Doire – c. 0.65km south-west
- Scoil Bhríde Primary School Edenderry – c. 0.75km south-west
- Saint Patrick's Primary School – c. 0.6km south-east
- St. Mary's Secondary School Edenderry – c. 0.7km south-east
- Saint Mary's Primary School Edenderry – c. 0.9km south-east
- Lindas Creche and Montessori – c. 0.3km north

Healthcare Services

The closest healthcare facility of significance is the Edenderry Health Centre, located slightly outside of the Proposed Development study area, c. 1.1km south-east of the site. Other minor healthcare facilities within the study area include:

- Sancta Maria Nursing Home – c. 0.9km west
- Ofalia House (Retirement home) – c. 1km south-east
- The James Clinic (dental clinic) – c. 0.3km west

Emergency Services

The nearest Garda Station is Edenderry Garda Station, located approximately 1.0 km south-east of the Proposed Development site. The nearest fire service facility is Edenderry Fire Station, situated approximately 0.9km south-east of the site, while Edenderry Ambulance Station is located approximately 0.8km to the south.

Places of Worship

There is only one place of worship within the Proposed Development study area, the St Mary's Catholic Church located c. 0.9km south-east of the proposed Temporary Construction Compound 03.

Green Infrastructure, Landscape and Amenity within the Study Area

Noteworthy recreational features in the vicinity of the Proposed Development include a range of sports, leisure, and community facilities.

To the southern, southeastern and southwestern portion of the Temporary Construction Compound 03, recreational amenities include Brian Clark Park (c. 0.7km), Derry Rovers & Acorn Football for All (c. 0.85km), Derry Rovers A.F.C. (c. 0.75km), Enda Joseph Avenue Park (0.95km). To the northeast, is located the Edenderry GAA – Weavers Fields (c. 0.9 km).

To the east and west of the pipeline corridor are located the Irish Archery Club (1km), Hawthorn Equestrian Centre (c. 0.15km), Caitriona O'Meara Equine Training (0.95km) and Clonard Vintage & Heritage Club (0.3km).

These facilities contribute to the availability of a diverse range of recreational opportunities for the local population within the wider Study Area.

In terms of landscape amenity, the lands surrounding the site constitute predominantly rural and agricultural greenfields. The primary land use in this area is farming, with scattered residential properties

and farmsteads. There are no listed or scenic views, no landscape or amenity designations pertaining to the site.

The Meath County Development Plan 2021–2027 and the Offaly County Development Plan 2021–2027 have been reviewed in respect of policy objectives for the protection and management of each county's archaeological and architectural heritage. Architectural heritage is safeguarded through inclusion in the Record of Protected Structures (RPS) and through the designation of Architectural Conservation Areas (ACAs).

There are seven structures from the National Inventory of Architectural Heritage (NIAH) within the study area, which are also included in the Record of Protected Structures (RPS). These structures are listed in Table 12-4 and illustrated in Figures 12-1 to 12-44 of Chapter 12 (Archaeological, Architectural and Cultural Heritage).

Table 12-7 of Chapter 12 identifies six Areas of Archaeological Potential within the Study Area, and a total of 32 recorded archaeological sites and monuments are listed in Table 12-2 of Chapter 12. The Proposed Development does not fall within an Architectural Conservation Area (ACA).

4.3.2.2 Tourism within the Study Area

Tourism in Ireland has experienced a strong resurgence in recent years and remains a key contributor to national economic success. Within County Meath, the importance of tourism is recognised in the Meath County Development Plan 2021–2027 (Chapter 4: Economy and Employment Strategy), which states:

> *"Tourism and recreation are noted as key sectors in both the economic and social development of the County, providing opportunities for employment and wealth generation, and also facilities and infrastructure that enhance the quality of life for residents."*

Similarly, the importance of tourism is also recognised in the Offaly County Development Plan 2021-2027 (Chapter 5: Economic Development Strategy), which states:

> *"The Council recognises that the tourism sector is emerging as key economic driver for the county. The county possesses a rich array of natural, built and cultural heritage."*

The Proposed Development site lies within a predominantly agricultural and residential setting. The site itself does not currently serve a tourism function.

4.3.2.3 Natural Resources within the Study Area

Geological Heritage, and Economic Resources

Natural resources and land use within the Study Area have also been considered, as they may have implications for the development of the site. A review of Geological Survey Ireland (GSI) online maps indicates that there are no extractive industries, active quarries, or mineral localities in the area. No geological heritage sites are identified within the site boundary or in close proximity (GSI, 2025).

Recreational Waters and Bathing Waterbodies

A review of the Environmental Protection Agency's (EPA) online mapping that includes the Register of Protected Areas (RPA) under the Water Framework Directive (WFD) has shown that there are no Recreational Waters or Bathing Waterbodies located in the immediate vicinity of the site or downstream in any of the watercourses or rivers through which the pipeline route traverses / crosses. Surface Water Quality.

Drinking Water Resources

A review of Geological Survey of Ireland (GSI) and EPA online maps, including water abstraction locations and Groundwater Public Supply Source Protection Zones (SPZs), has been undertaken as part of Chapter 6 (Hydrology and Hydrogeology).

The nearest Group Water Scheme (Preliminary Source Protection Area Zone of Contribution) to the site is Ballykilleen (Zone of Contribution Unique ID IE_GSI_ZOC_37), which is located c. 400m to the east of the subject development site at the point of closest proximity. The subject development site is outside the zone of contribution for this supply.

In addition, groundwater source protection zones, which are zones defined by the GSI within which development is limited in order to protect groundwater from potential pollution, are not identified by the GSI under / beneath the site or in the immediate adjacent lands / vicinity. The Public Water Supply / Public Supply Source Protection Area / Zone (SPZ) / drinking water protection area in closest proximity to the Proposed Development site is the EDENDERRY PWS (Source Protection Area Unique ID: IE_GSI_SPA_269), which is located c. 2.7 km east of the pipeline route beneath the townland of Edenderry (linear distance at the point of closest proximity). The subject development site is outside the zone of contribution for this supply.

Neither of these areas share a hydrological or hydrogeological connection to the site and are located hydrologically upgradient / upstream of the development site.

4.3.3 Risk of Major Accident Hazards or Disasters

The potential for a project to cause risks to human health, cultural heritage, or the environment due to its vulnerability to external accidents or disasters is considered where such risks are significant, e.g., the potential effects of floods on sites with sensitive facilities. Where such risks are significant then the specific assessment of those risks in the form of a Seveso Assessment (where relevant) or Flood Risk Assessment may be required.

Landslides, Seismic Activity and Volcanic Activity

In general, risk of landslides in Ireland is considered to be low, as the country is not located in a region with high seismic activity or large mountain ranges. Landslides are more common in unconsolidated material than in bedrock, and where the sea constantly erodes the material at the base of a cliff landslides and falls lead to recession of the cliffs. Landslides have occurred in Ireland in recent years in upland peat areas due to disturbance of peat associated with construction activities. The landslide susceptibility map (GSI spatial map viewer) identifies areas which are subject to landslides and is measured from low to high. The landslide susceptibility map considers the location of landslides and what causes them (slope, soil type and the impact of the flow of water). Based on the GSI spatial map viewer, the Proposed Development site is not in an area susceptible to landslides, with a GSI Landslide Susceptibility Classification of 'Low' to 'Moderately Low'.

There are no active volcanoes in Ireland so there is no risk of volcanic activity.

In Ireland, seismic activity is recorded by the Irish National Seismic Network. The Geophysics Section of the School of Cosmic Physics, Dublin Institute for Advanced Studies, has been recording seismic events in Ireland since 1978 (www.dias.ie). This network consists of several seismometers that are located throughout Ireland. Seismic activity and earthquake risk in Ireland are generally considered to be low. This is because Ireland is located on the western edge of the Eurasian Plate, which is a tectonic plate that is not known for its seismic activity. However, earthquakes can still occur in Ireland, although they are typically small and have little impact. very low risk of seismic activity to the Proposed Development site.

This means that there is less than a 2% chance of potentially damaging earthquake shaking in the next 50 years.

The Proposed Development site is not vulnerable to landslides, seismic activity or volcanic activity within its boundary. Therefore, there is no significant potential for the Proposed Development to cause risks to human health due to its vulnerability to landslides, seismic activity or volcanic activity.

Proximity to Seveso Sites

The Chemical Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (S.I. 209 of 2015) or 'COMAH' regulations define the "consultation distance" as a distance or area relating to an establishment, within which there are potentially significant consequences for human health or the environment from a major accident at the establishment, including potentially significant consequences for developments such as residential areas, buildings and areas of public use, recreational areas and major transport routes.

Establishments are either lower tier establishments or upper-tier COMAH sites with above threshold quantities of dangerous substances present, and to which the provisions of the COMAH regulations apply. The Proposed Development does not meet or exceeds the thresholds for either lower or upper tier. The Health and Safety Authority (HSA) list of Notified Seveso Establishments has been reviewed to identify if the Proposed Development falls within the consultation distance of any nearby Seveso Establishments.

There are no Upper or Lower Tier Notified Seveso Establishments within the Study Area.

The closest Notified Seveso Establishments to the Proposed Development is the Lower Tier establishment Castlelost FlexGen Ltd. facility, located c. 15 km west of the Proposed Development site. The Proposed Development is not within the consultation distance of the Castlelost FlexGen Ltd. site, and therefore due to the separation distance there is no interaction with the Proposed Development at this location.

The site is not a Seveso facility and is not within the consultation distance of any Seveso facility. Therefore, there are no implications for major accidents or hazards at the Proposed Development site.

Proximity to Industrial Emissions Sites

According to the EPA (2026) there are 5 no. Industrial Emissions (IE) and Waste facilities within a 2 km radius of the Proposed Development site:

- Bord na Móna (BnM) Cushaling Peaker Plant located within Edenderry Power Limited site (EPA Ref: P0482-04). The Proposed Development terminates at this Site.
- Rosderra Irish Meats Group Unlimited Company EPA Ref: (P0180-02
- Rosderra Farms Unlimited Company (EPA Ref: P0681-01)
- Clonbulloge Ash Repository (EPA Ref: W0049-02)
- Breedon Cement Ireland Limited (EPA Ref: P0487-07)

While a number of EPA licensed IE/IPPC facilities are located within the wider area, the Proposed Development comprises an underground gas transmission pipeline, the Kilwarden Offtake Installation, and Ballykilleen AGI on the Edenderry Power Limited site with no onsite combustion or emissions. As such, there is no direct operational interaction with these facilities and no pathway for significant environmental effects.

The presence of these IE Licenced sites in the wider vicinity of the Proposed Development site is relevant in terms of contextual land use. Aside from the direct connection to the Edenderry Power Limited site (P0482-04), the Proposed Development does not alter the emissions profile or licensing requirements of other licenced sites listed above or otherwise. Overall, the risk of significant cumulative or interactive effects between the Proposed Development and surrounding IE licensed facilities is considered to be low.

The purpose of the Proposed Development is to provide the licenced site at the Edenderry Power Limited (P0482-04) with a natural gas supply which will facilitate the conversion of the existing Cushaling Peaker Plant on the site from their current single-fuel operation (liquid fuel) to dual-fuel operation, with natural gas as the primary fuel and liquid fuel retained as backup.

Risk of Flooding

A Flood Risk Assessment has been undertaken by JBA Consulting in accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (DoEHLG & OPW, 2009). With reference to this assessment:

- The principal source of fluvial flooding affecting the site is the River Boyne and a number of its tributaries, including the Figile River, as identified through review of the National Indicative Flood Maps (NIFM) and CFRAM flood events. The site includes areas located within Flood Zones A, B and C, reflecting varying degrees of fluvial flood risk along the route.
- Pluvial flooding is the result of rainfall-generated overland flows that arise before run-off can enter a watercourse or sewer. Rainwater can pond and accumulate on hard surfaces if not properly managed. Pluvial flood potential may arise from localised depressions in the ground at the site but is not considered a significant risk.
- To confirm the NIFM flood extents in certain areas a limited extent hydraulic model was developed. This confirmed that in the vicinity of the River Boyne, the pipeline does cross Flood Zone A/B. There is limited overtopping of the Figile River in the vicinity of the proposed AGI. The flood extents at WCX04 confirms that the flood waters for the 1% AEP and 0.1% AEP flood events remain in bank in the vicinity of the gas pipeline.

4.4 Characteristics of the Proposed Development

The purpose of this section is to provide an overview of the key relevant details of the construction phase and operational phase of the Proposed Development. The information presented in this section is informed by the project design, but it is not a complete description of the Proposed Development. Therefore, it should be read in conjunction with the full development package. For a more comprehensive understanding of the Proposed Development, refer to Chapter 2 (Description of the Proposed Development) of the EIAR. Chapter 2 provides a detailed overview of the lifecycle of the Proposed Development, including reference to the mechanical and civil engineering, drawings, plans, reports, and other relevant documents in order to define the Proposed Development.

The Proposed Development primarily comprises an underground transmission gas pipeline, approximately 23.5 km in length, which will provide a gas connection to the Bord na Móna (BnM) Cushaling Peaker Plant. The pipeline will originate at the Kilwarden Offtake Installation, located in Kilwarden, Co. Meath, and will route south, cross-country through Counties Meath and Offaly, terminating at the proposed Ballykilleen Above Ground Installation (AGI) located in the Edenderry Renewable Energy Complex located in Kilcumber, Co. Offaly. The lands within the red line boundary will accommodate the GNI 143 Ballykilleen Pipeline, the Kilwarden Offtake Installation, and the Ballykilleen AGI, as well as two off-route areas to be used as pipe storage compounds during the construction phase.

4.4.1 Construction Phase

The main construction phase of the Proposed Development will involve the installation of a 23.5 km underground gas transmission pipeline using a combination of open-cut trenching in greenfield areas, as well as trenchless techniques for some road, watercourse and river crossings. The pipeline will originate at the Kilwarden Offtake Installation, located in Kilwarden, Co. Meath, and will route south, cross-country through Counties Meath and Offaly, terminating at the proposed Ballykilleen Above Ground Installation (AGI) located in the Edenderry Renewable Energy Complex located in Kilcumber, Co. Offaly. The lands within the red line boundary will accommodate the GNI 143 Ballykilleen Pipeline, the Kilwarden Offtake

Installation, and the Ballykilleen AGI, as well as two off-route areas to be used as temporary construction compounds during the construction phase.

Temporary construction compounds will be established to accommodate site offices, welfare facilities, plant, materials, and construction personnel.

The main construction phase of the Proposed Development includes the development of the Kilwarden Offtake Installation, and the Ballykilleen AGI at the northern and southern ends of the pipeline.

Construction works will be undertaken during normal working hours and will generate typical short-term construction-related activities, including excavation, pipe welding, machinery movements, deliveries of materials, and reinstatement works.

All construction activities will be carried out in accordance with a Construction Environmental Management Plan, incorporating measures to minimise emissions, control dust and noise, manage waste, prevent pollution, ensure traffic safety, and protect workers and the public.

4.4.2 Operational Phase

Once constructed, the gas transmission pipeline will operate as a fully underground, closed system requiring no on-site staff and no above-ground infrastructure along the route, aside from marker posts. Routine inspections will be limited to occasional maintenance vehicle visits.

Once constructed, the proposed underground transmission gas pipeline will not require any staff to operate. GNI maintenance staff, one van, will carry out checks every two weeks to a month along with routine inspection and maintenance, including pigging, of the asset every seven to ten years. Maintenance shall be in accordance with GNIs Functional Specification Requirements document.

4.5 Potential Impacts of the Proposed Development

The main potential impacts on population and human health from the Proposed Development are potential for spills/leaks, air emissions, noise, visual, and traffic impacts. The baseline environment, pollution pathways, relevant mitigation measures and residual impacts have been assessed in greater detail within the corresponding specialist chapters: Chapter 5 (Land, Soils, and Geology); Chapter 6 (Hydrology and Hydrogeology); Chapter 8 (Air Quality), Chapter 10 (Noise and Vibration); Chapter 11 (Landscape and Visual Impact); and Chapter 13 (Traffic and Transportation).

A summary of the main potential impacts as they are relevant to human health criteria during construction and operation of the Proposed Development is presented herein.

4.5.1 Construction Phase

4.5.1.1 Potential Impacts on Businesses and Residences

The main potential impacts on local businesses and residences associated with the Proposed Development will be in relation to nuisances: air quality, noise, visual impact and traffic. The potential impacts and mitigation measures to address them are dealt with within the corresponding chapters of this EIAR as follows:

- Chapter 8 – Air Quality
- Chapter 10 – Noise and Vibration
- Chapter 11 – Landscape and Visual Impact
- Chapter 13 – Traffic and Transportation

Construction will have an indirect positive effect on support industries such as builder suppliers, construction material manufacture, maintenance contracts, equipment supply, landscaping and other local services.

For nearby residences, no significant adverse impacts are anticipated. Temporary effects such as increased traffic or noise during construction will be limited in duration and managed through standard mitigation measures.

The construction phase, therefore, is considered to have the potential to have a ***positive, local to regional, imperceptible***, ***short-term*** impact on the economy and employment of the local and wider area.

4.5.1.2 Potential Impacts on Landscape, Amenity and Tourism

Overall, the site is located within a robust rural landscape context that is not highly susceptible to change and is influenced by a mix of anthropogenic land uses and built features.

According to Sections 11.3.1.1 and 11.3.1.2 and the criteria outlined in Table 11-1 of Chapter 11 (Landscape and Visual), the landscape sensitivity at the Proposed Development area is assessed as medium-low, with some localised variation.

During the construction phase, activity levels will be higher than during operation and will include heavy vehicle movements, construction machinery, temporary lighting, and material storage. These activities will be more noticeable in some locations; however, HGV movements are common along regional roads and the M4 motorway corridor. Physical impacts will primarily relate to topsoil stripping (typically to a depth of 300 mm), excavation of a relatively narrow trench along the route, and localised hedgerow removal at boundary crossings. These impacts are short-term, localised and temporary in nature.

Due to the modest scale of works, temporary duration, and limited visibility provided by surrounding hedgerow networks, the magnitude of landscape effects during construction is assessed as low within the immediate site surroundings, reducing to low-negligible or negligible in the wider study area. When considered in combination with the medium-low landscape sensitivity, the significance of construction-phase effects is assessed as slight locally, reducing to slight-imperceptible or imperceptible elsewhere. Construction-stage landscape effects are anticipated to be no greater than ***negative, slight*** and ***short-term.***

In terms of visual effects, coupled with the Medium-low visual receptor sensitivities in the surrounds of the site, the significance of construction stage visual effects in the immediate vicinity of the site will be no greater than ***negative, moderate-slight*** and ***short-***term. This impact will reduce considerably beyond 500m from the site, where the Proposed Development will be heavily screened. As a result, construction stage visual effects are assessed as ***not significant.***

The Proposed Development area is not considered as having a touristic significance and the development will not impact existing shopping amenity areas as it will be mostly comprised within agricultural land. The Proposed Development will not create any significant wastewater discharge which could have a potential impact on local amenities or the local population. Therefore, impacts are expected to be ***neutral***, ***not significant*** and ***short term.***

4.5.1.3 Potential Impact from Land and Water Emissions on Human Health

With reference to Chapter 5 (Land, Soils and Geology), excavation activities on site may encounter localised areas of contamination that will require excavation and appropriate disposal at a licensed facility. Material exported from the site, if not correctly managed or handled, could negatively affect human beings both on-site and off-site. A reduction in soil quality resulting from historical or unmitigated pollutants entering the soil has the potential to lead to negative impacts on human health during the construction

phase. Hydrocarbons and petroleum products, for example, pose a risk to humans through the inhalation of fumes or dust associated with contaminated soils.

Given the historic use of the site as predominantly greenfield, characterised by agricultural activity, the risk of potentially contaminated soils is considered low.

In the absence of mitigation measures, the potential impacts on human health during the construction phase, in relation to land, soils and geology, are considered ***negative, imperceptible*** and ***short-term.***

With reference to Chapter 6 (Hydrology and Hydrogeology) A reduction in surface water or groundwater quality via unmitigated pollutants entering the adjacent drainage ditch, stream or downstream surface waterbody or entering the soil and migrating to the underlying aquifer / GWB has the potential to lead to negative impacts on human health and populations if a pathway existed.

Hydrocarbons and petroleum products for example have the greatest risk for human health when they are in drinking water. Furthermore, humans can also be exposed to petroleum hydrocarbons or other contaminants by inhaling the fumes / dust from contaminated groundwater / surface water (or soil). Depending on the type of contaminant and the level of exposure, soil contamination can have serious health implications.

The site is located in proximity of the Ballykilleen National Federation of Group Water Schemes (NFGWS) Group Scheme Source Protection Area (c. 400m east of the Proposed Development site) and the EDENDERRY PWS (c. 2.7 km east of the Proposed Development site). Given the separation distance between the Proposed Development site and the nearest groundwater source protection zones there are no potential impacts on groundwater source protection zones (proposed site is outside of the zone of contribution of this supply). Additionally, as there are no recorded recreational waters or bathing waterbodies, or surface water drinking RPA located downstream of the development, hence there is no potential for impacts on human health and populations.

There is no source pathway linkage to the underlying aquifer or any Public Drinking Water Supply scheme or Source Protection Zone (SPZ). The nature and thickness of soil cover present at the site provides a natural level of protection. No bulk oil storage is required during site operation.

While a portion of the Proposed Development site runs within close proximity of the wider Edenderry town area, which is serviced by Local Authority potable water mains, the route is predominantly located in a rural setting and therefore there is a high probability that there are wells in the vicinity of the Proposed Development site that are used for potable supply.

No likely impact on the groundwater quality is foreseen due to low potential loading, and natural attenuation within overburden, reducing potential for off-site migration.

Given this greenfield land has historically been utilized for agricultural purposes, the potential risk of extensive contamination is considered low.

Any contaminated / hazardous water encountered onsite will be removed from site and sent to a licenced treatment / disposal facility that accepts the corresponding soil classification / category, while clean soils maybe be reused onsite for backfill, reinstatement / landscaping. Therefore, on this basis in the absence of mitigation measures the potential impacts during the construction phase on human health and populations due to changes to the potential for contamination of soil and groundwater are ***negative***, ***slight*** and ***short term.***

There are minimal potential impacts during the construction phase on human health and populations due to changes to the hydrological environment.

4.5.1.4 Potential Impact from Air Quality on Human Health

The greatest potential impact on air quality during the construction phase of the Proposed Development arises from construction dust emissions and the potential for nuisance dust. Construction dust typically deposits within 250 m of a construction site; however, the majority of deposition occurs within the first 50 m. The extent of dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts, etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition is influenced by local meteorological factors, including rainfall, wind speed and wind direction. A review of Casement meteorological data indicates that the prevailing wind direction is westerly to south-westerly (Section 8.3.1 of Chapter 8).

In terms of receptor sensitivity to dust soiling, there are between 1 and 10 residential properties within 20 m of the Proposed Development site area and less than 100 sensitive receptors within 250 m. In line with the UK Institute of Air Quality Management (IAQM) guidance document *Guidance on the Assessment of Dust from Demolition and Construction* (IAQM, 2024), as referenced in Chapter 8 (Section 8.3.3), the overall sensitivity of the area to dust soiling impacts is **medium** based on the IAQM criteria outlined in Chapter 8, Table 8-4, with a **low** impact in relation to human health.

There is at most a high risk of dust soiling impacts and a medium risk of dust-related human health impacts associated with the proposed works. There is also potential for traffic emissions to impact air quality over a short-term during the construction phase, particularly due to an increase in HGV movements accessing the site. Construction stage traffic has been reviewed, and a detailed air quality assessment has been scoped out, as none of the road links affected by the Proposed Development satisfy the Transport Infrastructure Ireland (TII) assessment criteria outlined in Chapter 8, Section 8.2.2.2.

Following completion of the initial site clearance works, HGV movements during the build period will be evenly distributed throughout the day and, as such, will not result in significant impacts during peak traffic periods.

When considered collectively, and in the absence of mitigation, the construction phase of the Proposed Development has the potential to result in a ***short-term, direct, localised, negative*** and ***slight*** impact on air quality, which may potentially give rise to human health implications.

4.5.1.5 Potential Impact from Noise and Vibration on Human Health

Exposure to excessive noise is becoming recognised as a large environmental health concern. According to the 2015 European Commission report 'Noise Impacts on Health', (European Commission, 2015), the most common effects of noise on the vulnerable include:

- Annoyance
- Sleep Disturbance
- Heart and circulation problems
- Quality of Life
- Cognitive Process
- Hearing

It is acknowledged that humans are particularly sensitive to vibration stimuli and that any perception of vibration may lead to concern. In the case of road traffic, vibration is perceptible at around 0.5mm/s and may become disturbing or annoying at higher magnitudes. Noise and vibration impacts associated with the development have been fully considered within Chapter 10 of the EIAR.

Noise impacts have been assessed for the key construction activities along the Proposed Development and are detailed in Section 10.5.1 of Chapter 10. At the Kilwarden Offtake Installation, the closest noise-sensitive location (NSL), located within 260 m of the nearest works boundary, is predicted to experience construction noise levels considerably below the daytime construction noise threshold (CNT) value of 65

dB LAeq,T. A significant effect is therefore not predicted in relation to the nearest NSLs at these distances in terms of this aspect of potential construction noise. At all receivers the associated effect is ***negative, not significant*** and ***temporary.***

For the Pipeline construction, the construction noise levels (CNLs) presented in Chapter 10, Table 10-18 are above the daytime CNT value of 65 dB LAeq,T where works are taking place simultaneously within 45 m from the works boundary in the absence of noise mitigation. The associated effect at the nearest NSLs within 45 m is therefore ***negative***, ***significant*** to ***very significant*** and ***temporary***. At further distances, the associated effect is ***negative, not significant*** to ***moderate*** and ***temporary.***

The distance from the nearest NSLs to the trenchless crossing works at the Kilwarden River (RVX01), the Yellow River (RVX02), the M4 Motorway (RDX04) and the Grand Canal (WCX23) ranges from 280 m to 390 m. The CNLs presented in Chapter 10, Table 10-18 are significantly below the daytime CNT value of 65 dB LAeq,T where works are taking place at these distances. A significant effect is therefore not predicted in relation to the nearest NSLs to trenchless crossing works at the Kilwarden River (RVX01), the Yellow River (RVX02), the M4 Motorway (RDX04) and the Grand Canal (WCX23).

At the nearest NSLs to the trenchless crossing works at RDX02, RDX03 and RDX14, between 25 m and 50 m distance from the works boundaries, the construction noise levels (CNLs) presented in Chapter 10, Table 10-18 are above the daytime CNT value of 65 dB LAeq,T in the absence of noise mitigation. The associated effect at the nearest NSLs at distances within 50 m of trenchless crossing works is therefore ***negative***, ***slight*** to ***very significant*** and ***temporary***. At all other receivers the associated effect is ***negative***, ***not significant*** to ***slight*** and ***temporary***.

At the AGI construction site, the closest NSL, located within 490 m of the nearest works boundary, is predicted to experience construction noise levels of 39 dB LAeq,T. Given the daytime CNT value of 65 dB LAeq,T, a significant effect is therefore not predicted in relation to the nearest NSLs at these distances in terms of this aspect of potential construction noise. Overall, at all receivers, the associated noise effect is ***negative, not significant*** and ***temporary.***

At the closest NSL to temporary bridge installation works, within 100m of the closest works boundary, the predicted CNL is below the daytime CNT value of 65 dB LAeq,T. A significant effect is not predicted in relation to the nearest NSLs at these distances in terms of this aspect of potential construction noise. The associated effect at the nearest NSLs at distances between 100 m and 160 m is therefore ***negative***, ***slight*** to ***moderate*** and ***temporary***. At all other receivers the associated effect is ***negative, not significant*** and ***temporary.***

At Temporary Construction Compound 04, the nearest NSL is within 15 m of the temporary compound works boundary. The CNL presented in Chapter 10, Table 10-19 is above the daytime CNT value of 65 dB LAeq,T where works are taking place simultaneously within 15 m from the works boundary in the absence of noise mitigation. The associated effect at the nearest NSLs to Temporary Construction Compound 04, where works are taking place simultaneously within 15 m, is therefore ***negative***, ***very significant*** and ***temporary***. At the nearest NSLs to all other temporary compounds associated with the application, The associated effect is ***negative***, ***not significant*** and ***temporary***.

With regard to additional construction traffic on local roads generated by the Proposed Development, traffic volumes would need to increase by approximately 25% to result in a 1 dB increase in traffic noise levels. As outlined in Chapter 13 (Traffic and Transportation), construction-phase traffic increases on affected road links range from 0.6% to 2.2% and will not result in a significant noise impact. Noise associated with construction activities is assessed as ***neutral, imperceptible*** and ***short-term.***

In terms of vibration, due to the distance of activities from the site to the nearest sensitive locations and controlling vibration levels to those detailed in Chapter 10, Table 10-3, the associated effect is stated to be ***neutral, imperceptible*** and ***temporary.***

4.5.1.6 Potential Impact from Traffic and Transportation on Human Health

The World Health Organisation Report 'Health Effects and Risks of Transport Systems: The Hearts Project' (World Health Organisation, 2006) states that road traffic is a major cause of adverse health effects - ranking with smoking and diet as one of the most important determinants of health in Europe. The report states:

"Traffic-related air pollution, noise, crashes and social effects combine to generate a wide range of negative health consequences, including increased mortality, cardiovascular, respiratory and stress-related diseases, cancer and physical injury. These affect not only transport users but also the population at large, with particular impact on vulnerable groups such as children and elderly people, cyclists and pedestrians"

In the Department of Communications, Climate Action & Environment document *Cleaning Our Air – Public Consultation to Inform the Development of a National Clean Air Strategy* vehicle emissions are included as a key source of health impacts in Ireland (DOCCA&E, 2017).

An assessment of the additional traffic movements associated with the Proposed Development during the construction and operational phases is presented in Chapter 13 (Traffic and Transportation). The Chapter states that the impacts of site operative and construction vehicles on the surrounding road network will be reduced by the offset nature of trips from that of the receiving road network and the traffic assessment.

However, the proposed works will require trenching and reinstatement at the various crossings of public roads and there will be a need to carry out the works under traffic management via shuttle working or by road closure with associated diversions. This will impact local traffic to the road crossing through disruption and longer journeys at diversions.

In the absence of any traffic management during the increase in traffic during the construction phase on the existing road has the potential for ***neutral, negligible*** and ***temporary effects*** (effects lasting less than a year) on the existing road network.

Furthermore, traffic management for the various crossings of public roads during the construction phase has the potential for ***negative, moderate*** and ***brief effects*** (effects lasting less than a day) to ***temporary effects*** (effects lasting less than a year) on the existing road network.

4.5.1.7 Potential Impacts from Major Accident Hazards and/or Natural Disasters on Population and Human Health

As outlined in Section 4.3.3 of this Chapter there is a very low risk of seismic activity to the Proposed Development site, no risk of volcanic activity and sea level rise. Regarding landslides, the landslide susceptibility classification of the site ranges between 'Low' to 'Moderately Low' as detailed in Chapter 5 (Land, Soils and Geology). As such, there is a negligible risk of landslides occurring at the site.

There are no COMAH sites located within Proposed Development study area. The Proposed Development is considered appropriate and with a negligible risk of being impacted by a COMAH site.

A Flood Risk Assessment has been undertaken by JBA Consulting in accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (DoEHLG & OPW, 2009). With reference to this assessment:

- For sections of the pipeline constructed in Flood Zone A/B, observations of river flood levels and weather warnings will ensure that the flood risk has been minimised.
- Due to the location of the pipeline and the mitigation methods employed, the potential impacts from flooding to the pipeline are considered negligible. There will be no impact to groundwater flow as a result of the mitigation methods related to the pipe drilling and trench construction methods.

The potential effect is therefore ***imperceptible***, and unlikely, with respect to Major Accident Hazards or Natural Disasters on Population and Human Health during the Construction Phase of the Proposed Development .

4.5.2 Operational Phase

4.5.2.1 Potential Impacts on Businesses and Residences

The main potential impacts on local businesses and residences associated with the Proposed Development will be in relation to nuisances: air quality, odour, noise, visual impact and traffic. The potential impacts and mitigation measures to address them are outlined in the following sections of this chapter and in detail within the corresponding chapters of this EIA Report as follows:

- Chapter 8 – Air Quality and Odour
- Chapter 10 – Noise and Vibration
- Chapter 11 – Landscape and Visual Impact
- Chapter 13 – Traffic and Transportation

Once constructed, the proposed underground transmission gas pipeline will not require any staff to operate. GNI maintenance staff, one van, will carry out checks every two weeks to a month along with routine inspection and maintenance, including pigging, of the asset every seven to ten years.

During the operational phase, the Proposed Development will not create new employment opportunities and is expected to have a ***neutral, imperceptible, long-term*** impact on businesses and residences.

4.5.2.2 Potential Impacts on Landscape, Amenity and Tourism

Following completion of the construction phase, any disturbed road surfaces or agricultural grassland along the pipeline corridor will be reinstated. Consequently, the pipeline will be largely invisible, aside from the permanent above-ground pigging compounds at the Kilwarden Offtake Installation and Ballykilleen AGI. Operational impacts will primarily relate to infrequent and brief maintenance works along the corridor, which will be far less intensive than construction activities. For these reasons, the underground pipeline is considered to have a negligible magnitude of landscape effect. In combination with the medium-low landscape sensitivity, the significance of operational-stage landscape impacts is deemed ***neutral, imperceptible*** and ***long-term***. Operational-phase landscape effects are therefore assessed as not significant.

Post construction and reinstatement, the visual effects of the Proposed Development will be limited to the Ballykilleen AGI and the Kilwarden Offtake Installation, which will both be enclosed by a 2.4m high fence and surrounding hedgerow planting. Overall, the residual visual effects of the Proposed Development will minor with a ***neutral, imperceptible*** and ***permanent*** impact for most of the assessed viewpoints (VP1, VP2 and VP3). However, partial glimpses of some of the Cloncreen turbines and the existing built infrastructure within Edenderry Renewable Energy Complex will be visible to regional road corridor users at VP4, which will experience a ***negative, slight,*** and ***permanent*** impact.

The Proposed Development, once operational, will be mostly underground and will have no impact on local tourism, shopping amenities, parks, or larger amenity areas.

4.5.2.3 Potential Impact from Land and Water Emissions on Human Health

With reference to Chapter 5 (Land, Soils and Geology), there are no sensitive economic features, potential sources of contamination or historical geological features at the site. During the operational phase of the Proposed Development, there is no potential for impacts on human health and populations arising from changes to land, soils or geology.

The proposed underground gas transmission pipeline does not require an operational water supply or generate wastewater, and the underground pipeline will not alter existing hardstanding areas. All trenches established across roads to facilitate the proposed pipeline will be fully reinstated. Additional hardstanding will be provided at the above-ground compound/pigging station location adjacent to the hot tap connection, which will result in a minor increase in surface water generation that will drain to adjacent land.

There is limited potential for leaks or spills of petroleum hydrocarbons during site maintenance activities in the operational phase. Unmitigated leaks or spills may lead to contamination of soil or groundwater, and soils contaminated by petroleum hydrocarbons can affect soil health; however, there are no potential adverse impacts on human health and populations during the operational phase.

Therefore, in the absence of mitigation measures, the potential impacts on human health and populations during the operational phase, due to the potential for soil contamination, are assessed as ***neutral, imperceptible*** and ***long-term.***

With reference to Chapter 6 (Hydrology and Hydrogeology), there is no potential for unmitigated off-site flooding arising from the minor, localised increases in hardstanding associated with the above-ground compound/pigging station location, offtake installation location and hot tap connection. Due to the flood risk characteristics at the site, the Proposed Development has no potential to impact human health, populations or material assets located downstream of the site.

There are no recorded recreational waters, bathing waterbodies or surface water abstraction points downstream of the Proposed Development site. There are also no recorded groundwater resource protection zones, groundwater source protection zones, Public Supply Source Protection Areas or Group Scheme Preliminary Source Protection Areas beneath the site or within the immediate surrounding area. The nearest Group Water Scheme (Preliminary Source Protection Area Zone of Contribution; Unique ID IE_GSI_ZOC_37) is Ballykilleen, located approximately 600 m east of the site, with the Proposed Development located outside the zone of contribution. The nearest Public Water Supply Source Protection Area is the Edenderry PWS (Unique ID IE_GSI_SPA_269), located approximately 2.7 km east of the pipeline route at its closest point, and the site lies outside the zone of contribution for this supply.

Accordingly, in the absence of mitigation measures, the potential impacts on human health and population during the operational phase, arising from changes to the hydrological and hydrogeological environment, are assessed as ***neutral, imperceptible*** and ***long-term.***

4.5.2.4 Potential Impact from Air Emissions on Human Health

As outlined in Chapter 8 (Air Quality), once constructed, the proposed GNI143 Ballykilleen Pipeline and AGPC will not require any on site staff to operate it. GNI maintenance staff, one van, will carry out checks every two weeks to a month along with routine inspection and maintenance, including pigging, of the asset every seven to ten years. Therefore, there is no potential for air quality impacts from operational traffic, and no further assessment is required.

The Ballykilleen AGI will contain small boilers (<1MWth) and a gas-fired backup generator. Because of their size and low thermal output, the emissions of these boilers are highly unlikely to cause a significant air quality effect and so have been scoped out of this assessment.

It can therefore be determined that the operational phase emissions will have a ***long-term, direct, localised, negative*** and ***not significant*** impact on air quality.

4.5.2.5 Potential Impact from Noise and Vibration Emissions on Human Health

As has been identified in Section 4.5.1.5 of this Chapter, noise and vibration related impacts can have negative consequences for human health. As detailed in Chapter 10 (Noise and Vibration), since the

proposed transmission gas pipeline route will be located underground, there will be no operational noise impacts associated with the Proposed Development. Mitigation measures are therefore not required.

The resultant noise effect is ***neutral***, ***imperceptible*** and ***long-term***.

4.5.2.6 Potential Impact from Traffic and Transportation on Human Health

As identified in Section 4.5.1.6 above, traffic-related impacts can have negative consequences for human health. As detailed in Chapter 13 (Material Assets – Transportation), the operational phase will not require permanent employees, with only intermittent visits resulting in occasional additional trips on the external road network. The additional traffic during the operational phase is therefore considered to have a ***neutral, imperceptible*** and ***long-term*** impact on the road network and on human health.

4.5.2.7 Potential Impacts from Major Accident Hazards and/or Natural Disasters on Population and Human Health

The Proposed Development has been designed with consideration given to the health and safety risks of people living and working in the vicinity. The Proposed Development has been designed by skilled personnel in accordance with internationally recognised standards, design codes, legislation, good practice and experience.

As outlined in Section 4.3.3 there is a very low risk of seismic activity to the Proposed Development site, and no risk of volcanic activity and sea level rise. Regarding landslides, the landslide susceptibility classification of the site ranges between 'Low' to 'Moderately Low' as detailed in Chapter 5 (Land, Soils and Geology). As such, there is a negligible risk of landslides occurring at the site.

There are no COMAH sites located within Proposed Development study area. The Proposed Development is considered appropriate and with a negligible risk of being impacted by a COMAH site. With respect to major accident hazards, a COMAH status assessment has confirmed that the Edenderry Renewable Energy Complex will remain a sub--COMAH status facility both before and after implementation of the Proposed Development. Accordingly, no credible major accident scenarios with the potential to affect human health have been identified.

A Flood Risk Assessment has been undertaken by JBA Consulting in accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (DoEHLG & OPW, 2009). With reference to this assessment:

- The Justification Test has been applied and passed as part of the FRA process.
- The proposed pipeline will be located underground and following construction, ground levels will be returned to their original state. A trenchless installation method will be used to install the gas pipeline under the Kilwarden River Crossing (RVX01) and Yellow River Crossing (RVX02) which will reduce ground disturbance and change to ground levels.
- The associated AGI plant is located in Flood Zone C and has a greater than 1m freeboard over the predicted 0.1% AEP flood event.
- Due to the location of the pipeline and the mitigation methods employed, the potential impacts from flooding to the pipeline are considered negligible. There will be no impact to groundwater flow as a result of the mitigation methods related to the pipe drilling and trench construction methods.

The potential effect is therefore ***imperceptible***, and unlikely, with respect to Major Accident Hazards or Natural Disasters on Population and Human Health during the Construction Phase of the Proposed Development .

4.6 Mitigation Measures

4.6.1 Construction Phase

The mitigation measures to address the potential impacts on population and human health from the Proposed Development have been assessed within the corresponding specialist chapters; Chapter 5 (Land, Soils, Geology and Hydrogeology); Chapter 6 (Hydrology); Chapter 8 (Air Quality), Chapter 10 (Noise and Vibration); Chapter 11 (Townscape / Landscape and Visual); Chapter 13 (Traffic and Transportation).

4.6.1.1 Businesses and Residences

There are no potential likely significant impacts on Businesses and Residences therefore additional measures are not required. Any impact will be further mitigated by the use of binding hours of construction as well as the measures set out in Chapter 5 (Land, Soils and Geology); Chapter 6 (Hydrology and Hydrogeology); Chapter 8 (Air Quality), Chapter 10 (Noise and Vibration); Chapter 11 (Landscape and Visual); Chapter 13 (Material Assets - Traffic and Transportation).

4.6.1.2 Landscape, Amenity and Tourism

With regard to landscape and visual, the mitigation measures proposed revolve round the implementation of appropriate site management procedures – such as the control of site lighting, storage of materials, placement of compounds, delivery of materials, car parking etc. Visual impact during the construction phase will be mitigated somewhat through appropriate site management measures and work practices to ensure the site is kept tidy, dust is kept to a minimum, and that public areas are kept free from building material and site rubbish. Mitigation measures are further detailed in Section 11.6.1 of Chapter 11 (Landscape and Visual).

4.6.1.3 Land and Water Emissions

All mitigation measures outlined within the Chapter 5 (Land, Soils, Geology) and Chapter 6 (Hydrology and Hydrogeology) will be implemented in accordance with Construction Environmental Management Plan (CEMP), as well as any additional measures required pursuant to planning conditions which may be imposed. The construction phase mitigation measures set out in the CEMP, will be implemented by the construction contractor to ensure that pollution and nuisances arising from site clearance and construction activities is prevented where possible and managed in accordance with best practice environmental protection.

4.6.1.4 Air Emissions

A suite of best practice dust mitigation measures, appropriate for sites with a high risk of dust impacts, is outlined in Section 8.6.1 of Chapter 8. These mitigation measures are further set out under the following categories: communications; site management; monitoring; preparing and maintaining the site; operating vehicle/machinery and sustainable travel; operations; waste management; measures specific to earthworks; measures specific to construction; and measures specific to trackout. The measures draw on best practice guidance from Ireland (DCC, 2018; DLRCC, 2022), the UK (IAQM, 2024; BRE, 2003; The Scottish Office, 1996; UK ODPM, 2002) and the USA (USEPA, 1997). These measures will be incorporated into the Construction Environmental Management Plan (CEMP) prepared for the site. The mitigation measures are divided into different categories to address different activities.

The dust mitigation measures described in Chapter 8 provide robust controls that will effectively minimise dust and air-quality impacts, thereby mitigating any associated human health impacts.

4.6.1.5 Noise and Vibration Emissions

With regard to construction activities, reference has been made to BS 5228-1 and BS 5228-2, which provide detailed guidance on the control of noise and vibration from construction activities. In accordance with this guidance, a range of mitigation measures will be considered and applied during the construction of the Proposed Development. These include management of construction activities through the selection of quiet plant, noise control at source, screening, control of working hours, liaison with the public, and monitoring.

These mitigation measures are further detailed in Section 10.6.1 of Chapter 10 (Noise and Vibration). The contractor will implement the most appropriate noise and vibration control measures, including plant selection, enclosures, screening and monitoring, depending on the level of noise or vibration reduction required at individual working areas.

4.6.1.6 Traffic and Transportation

During the Construction Phase, a Construction Traffic Management Plan (CTMP) will be prepared and agreed with the local authority prior to the commencement of works, in compliance with the relevant planning condition should permission be granted.

The Construction Traffic Management Plan (CTMP) will include measures to manage road crossings, control and monitor construction traffic, ensure that material deliveries are planned, scheduled and staggered and minimise mud or debris on public roads. HGV trips are anticipated to arrive and depart the site at a uniform rate throughout the day, to avoid pressure on the morning and evening peak hour periods. Full details of mitigation measures are discussed in Chapter 13 (Material Assets – Traffic and Transportation), Section 13.6.1.

4.6.1.7 Major Accident Hazards and/or Natural Disasters

All mitigation measures outlined in the submitted CEMP will be implemented throughout the construction phase of the development. This will include mitigation measures outlined within this EIAR. The CEMP includes emergency response procedures for environmental incidents. It will be continuously updated to manage risks during construction.

4.6.2 Operational Phase

The mitigation measures to address the potential impacts on population and human health from the Proposed Development have been assessed within the corresponding specialist chapters; Chapter 5 (Land, Soils and Geology); Chapter 6 (Hydrology and Hydrogeology); Chapter 8 (Air Quality), Chapter 10 (Noise and Vibration); Chapter 11 (Landscape and Visual); Chapter 13 (Material Assets - Traffic and Transportation).

4.6.2.1 Businesses and Residences

There are no potential likely significant impacts on Businesses and Residences therefore additional measures are not required.

4.6.2.2 Landscape, Amenity and Tourism

The primary mitigation measure employed in respect of landscape and visual impacts for the Proposed Development was avoidance of impacts. The key mitigation relevant to landscape and visual, as well as many of the other environmental factors, was to place the pipeline underground. This mitigation is embedded in the final design. Full details of mitigation measures are set out in Chapter 11.

4.6.2.3 Land and Water Emissions

It has been established in Chapter 5 (Land, Soils and Geology) and Chapter 6 (Hydrology and Hydrogeology) that there are no source–pathway linkages and, as such, no mitigation is required with regard to land and water emissions impact on Human Health during the operational phase.

4.6.2.4 Air Emissions

There is no mitigation required for the operational phase of the development as impacts to air quality are predicted to be ***not significant***.

4.6.2.5 Noise and Vibration Emissions

As the operational noise effect associated with the Proposed Development is ***imperceptible*** at noise-sensitive locations, mitigation measures are not required.

4.6.2.6 Traffic and Transportation

Due to the imperceptible increase in traffic associated with the operational phase of the development there are no further mitigation measures required.

4.6.2.7 Major Accident Hazards and/or Natural Disasters

The potential effect is imperceptible, and unlikely, in respect of major accident hazards or natural disasters on population and human health during the operational phase of the Proposed Development . Therefore, no specific mitigation measures are required.

4.7 Residual Impacts of the Proposed Development

4.7.1 Construction Phase

4.7.1.1 Businesses and Residences

As stated in Section 4.5.1.1 of this Chapter, the main potential impacts on local businesses and residences associated with the Proposed Development will be in relation to nuisances: air quality, noise, visual impact and traffic. The potential impacts and mitigation measures to address them are dealt with within the corresponding chapters of this EIA Report as follows:

- Chapter 8 – Air Quality
- Chapter 10 – Noise and Vibration
- Chapter 11 – Landscape and Visual Impact
- Chapter 13 – Traffic and Transportation

For nearby residences, no significant adverse impacts are anticipated. Temporary effects such as increased traffic or noise during construction will be limited in duration and managed through standard mitigation measures. The residual impacts on local businesses and residences in relation to air quality, noise, visual impact, and traffic has been summarised in the below sections.

Construction will have an indirect positive effect on support industries such as builder suppliers, construction material manufacture, maintenance contracts, equipment supply, landscaping and other local services.

The construction phase, therefore, is considered to have the potential to have a ***positive, local to regional, imperceptible***, ***short-term*** impact on the economy and employment of the local and wider area.

4.7.1.2 Landscape, Amenity and Tourism

It is not considered that the residual construction stage effects will notably differ from the construction stage impacts in Section 4.5.1.2 of this Chapter. Overall, the residual construction stage significance of landscape effects are deemed to be no greater than ***slight, negative*** and ***short-term*** in duration. The residual construction stage significance of visual effect is considered to be ***moderate-slight, negative*** and ***short-term***.

The Proposed Development will have no discernible effect on local tourism or amenities during construction stage.

4.7.1.3 Land and Water Emissions

Implementation of the mitigation and monitoring measures outlined in Sections 5.6.1 and 5.7.1 (Chapter 5) and Sections 6.6.1 and 6.7.1 (Chapter 6) will ensure that the potential impacts on human health and populations from land emissions during the construction phase are adequately mitigated.

As there is no source pathway linkage, no residual impacts are anticipated on human health and populations from water emissions.

The resulting residual effects on human health and populations from land and water emissions are assessed as ***neutral, imperceptible***, and ***short-term.***

4.7.1.4 Air Emissions

Best practice mitigation measures are proposed for the construction phase of the Proposed Development , which will focus on the proactive control of dust and other air pollutants, to minimise generation of emissions at source. The mitigation measures that will be put in place during construction will ensure that the impact complies with all EU ambient air quality legislative limit values, which are based on the protection of human health (see Chapter 8, Table 8-1). Therefore, the predicted residual, dust-related, human health impact of the construction phase of the Proposed Development is ***short-term, direct, localised, negative*** and ***not significant.***

4.7.1.5 Noise and Vibration Emissions

During the construction phase of the Proposed Development there may be some potentially significant impacts on nearby noise sensitive properties due to noise emissions from site traffic and other activities. The application of noise limits and hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impacts are kept to a minimum. The residual noise impact on human health is determined to be ***negative, slight*** to ***moderate*** and ***temporary.***

4.7.1.6 Traffic and Transportation

Construction works for the gas pipeline will be carried out in a linear manner through farmland and across carriageways which will result in localised delays due to traffic management and diversions. Based on the assessment of the network links there will be insignificant effects on the receiving traffic and transportation environments. The residual effect of construction works will be ***temporary, not significant*** and ***negative***.

4.7.1.7 Major Accident Hazards and/or Natural Disasters

There are no significant potential impacts on human health from major accident hazards and/or natural disasters; therefore, there are no residual impacts.

4.7.2 Operational Phase

4.7.2.1 Businesses and Residences

The Proposed Development will result in a ***neutral, imperceptible*** and ***long-term*** impact on the surrounding businesses and residences, as it does not give rise to additional employment opportunities.

The predicted impacts on local businesses and residences in relation to air quality, noise, visual impact, and traffic has been summarised below.

4.7.2.2 Landscape, Amenity and Tourism

As stated in Section 11.8.2 of Chapter 11 (Landscape and Visual), whilst the residual operational stage effects will be much the same as the impacts stated in 4.5.2.2 above, there will be a marginal reduction in the residual visual impact at receptors in the surrounds of the site, once the proposed screen planting has fully established. Once fully matured, the proposed planting will largely screen both the Kilwarden Offtake Installation and the Ballykilleen AGI, creating a much softer and site-specific boundary treatment. Thus, the residual significance of operational stage landscape impact is deemed not greater that ***slight-imperceptible, neutral-negative*** and ***permanent***, whilst the residual significance of operational stage visual impact will reduce to ***slight-imperceptible, neutral*** and ***permanent.***

The Proposed Development will have no discernible effect on local tourism or amenities during operational stage.

4.7.2.3 Land and Water Emissions

As there is no source pathway linkage, hence no mitigation is required. The residual effect on human health and populations during the operational phase is considered to be ***neutral, imperceptible*** and ***long-term.***

4.7.2.4 Air Emissions

Emissions of air pollutants during the operational phase are predicted to be significantly below the ambient air quality standards, which are based on the protection of human health. Therefore, residual impacts to human health related to air quality will be ***long-term, direct, localised, negative*** and ***not significant***.

4.7.2.5 Noise and Vibration Emissions

As the operational noise impact associated with the Proposed Development is ***neutral, imperceptible*** and ***long term***, there are no residual noise or vibration effects associated with the Proposed Development.

4.7.2.6 Traffic and Transportation

The Proposed Development will have no effect the road network, in particular the road links in the proximity of the development. Overall, the residual impact of the development will be ***long term*** in duration of ***imperceptible, neutral*** effect on the traffic and transportation environment and on human health.

4.7.2.7 Major Accident Hazards and/or Natural Disasters

There are no significant potential impacts on Human Health from Major Accident Hazards and/or Natural Disasters; therefore, there are no residual impacts.

4.8 References

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