CHAPTER 5

POPULATION AND HUMAN HEALTH

FEBRUARY 2025

QUARRY
CONSULTING

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CHAPTER 5: POPULATION AND HUMAN HEALTH

Introduction

5.1 The purpose of this chapter is to evaluate the potential impact of the proposed development on population and human health.

5.2 Whilst there are a range of issues which may impact on human beings (including both population and human health), many of these have been evaluated separately within this EIAR including Land, Soil and Geology (Chapter 7), Hydrology (Chapter 8), Climate (Chapter 9), Air Quality (Chapter 10), Noise and Vibration (Chapter 11), Visual and Landscape (Chapter 12), Traffic (Chapter 13), Heritage (Chapter 14) and Material Assets (Chapter 15).

Professional Competence

5.3 Quarry Consulting undertook the impact assessment presented in this chapter on behalf of Coshla Quarries Ltd. The lead consultant for the EIAR was Peter Kinghan (Chartered Mineral Surveyor), Post Graduate Diploma in Environmental Engineering. This chapter and the associated assessment has been completed by Irene Curran who is a chartered town planning consultant (MRTPI) with over 20 years' experience. Irene's qualifications are as follows:

- BSc Environmental Science (Honours) – University of Limerick – 1997.
- MSc Town and Country Planning (Distinction) – Queens University Belfast – 2000.
- Dip Field Ecology - University College Cork – 2014.

Legislative and Policy Context

5.4 The introductory text to Council Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment makes it clear that the intention was that EIA would address human health impacts:

> "*Whereas the effects of a project on the environment must be assessed in order to take account of concerns to protect human health, to contribute by means of a better environment to the quality of life, to ensure maintenance of the diversity of species and to maintain the reproductive capacity of the ecosystem as a basic resource for life…".*

5.5 Directive 2011/92/EU (which was amended by Directive 2014/52/EU) on the assessment of the effects of certain public and private projects on the environment makes the requirement to consider population and human health explicit as it introduces into Article 3 'population and human health' as a factor to be considered in Environmental Impact Assessment (EIA):

> ***Article 3***
>
> 1. *The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:*
>
> a) *population and human health;….*

5.6 EIA Directive does not define the term 'human health', however the 2017 EC Guidance on the preparation of the EIAR states:

> "*human health is a very broad factor that would be highly project dependent. 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. In addition, these would concern the commissioning, operation and decommissioning of a Project in relation to workers on the Project and surrounding population" (European Commission, 2017).

5.7 The 2022 EPA Guidelines highlight that the term "human health" was used in the Strategic Environmental Assessment (SEA) Directive (2001/42/EC). The Commission's SEA Implementation Guidance states at paragraph 5.26:

> '*The notion of human health should be considered in the context of the other issues mentioned in paragraph (f*[1]*) and thus environmentally related health issues such as exposure to traffic noise or air pollutants are obvious aspects to study.*

5.8 The 2002 EPA EIS Guidelines similarly advised that health be considered through assessment of the environmental pathways through which it could be affected, such as air, water or soil, namely:

> '*The evaluation of effects on these pathways (air, water, soil, etc) is carried out by reference to accepted standards (usually international) of safety in dose, exposure or risk. These standards are in turn based upon medical and scientific investigation of the direct effects on health of the individual substance, effect or risk. This practice of reliance upon limits, doses and thresholds for environmental pathways, such as air, water or soil, provides robust and reliable health protectors [protection criteria] for analysis relating to the environment*.' (EPA, 2002)

5.9 In accordance with this approach this chapter addresses population and human health in the context of other factors addressed elsewhere in further detail within the EIAR. The potential direct and indirect effects of the proposed development on population and human health as a consequence of key environmental factors are also considered in the following chapters:

Chapter 7: Land, Soils and Geology.

Chapter 8: Water

Chapter 10: Air Quality

Chapter 11: Noise and Vibration

Chapter 12 Landscape and Visual Impact Assessment

Chapter 13: Traffic.

Chapter 15: Material Assets.

5.10 In 2017, the Institute of Environmental Management and Assessment (IEMA) published the IEMA Primer. The IEMA document posits that human health spans environmental, social and economic aspects and does not merely represent an absence of disease. A broad understanding of human health is put forward, that should encompass factors such as local economy and community, rather than relying on a narrower focus on health. In this regard, the current chapter seeks to address population and human health in a wholistic manner, including

[1] *(f) the likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors*. Directive (2001/42/EC).

consideration of economic factors, settlement patterns, landscape and visual impact, and land-use.

Assessment Methodology and Significance Criteria

5.11 The effects of the proposed development on the human environment are assessed in compliance with the EIAR Guidelines as outlined in Chapter 2 (EIA Report Methodology). The evaluation of effects on employment, human health and amenity comprises a qualitative assessment based on the quantitative and qualitative analysis of potential effects on the environment undertaken in other chapters of this EIAR. The assessment also takes into account a review of relevant literature and professional judgement in relation to impact on population and human health.

Study Area

5.12 The site is within the within the Aughrim Electoral Division (ED). The following Electoral Divisions (ED's) are within a 5km radius of the application site, these Electoral Divisions have been selected as the study area, unless stated otherwise in this chapter:

- Aughrim
- Athenry
- Belleville
- Carnmore
- Greethill
- Lisheenavalla
- Oranmore
- Stradbally

Sources of Information

5.13 The desk-top study of the available data was undertaken to identify the populations of interest and characterise them in terms of their size, socio-economic status and existing health risks. The purpose was to build up a baseline understanding of the environmental and social issues and the characteristics of the communities affected. This information could then inform the assessment of proposed development to determine whether the existing conditions would be affected (positively or negatively) by the proposed development. The following sources of information informed the desk-top study.

- Spatial statistical data relating to the population within the study area has been obtained from the Central Statistics Office (CSO), including information from the 2016, 2011 and 2022 Census.

- Information on health profiles and health research have also been obtained from publicly available sources, including those produced by Lenus – *The Irish Health Repository* – a central source for open access health research in Ireland, the Health Service Executive (HSE) and the Institute of Public Health (IPH).

- Information on landuses and zoning were obtained using the Galway County Development Plan 2022 – 2028, Myplan.ie, Ordnance Survey mapping, aerial photography, a site visit and drone surveys of the site.

- Additional information on tourist attractions and initiatives in the were obtained from the following sources:
  - Fáilte Ireland website – https://www.failteireland.ie/.
  - Walking trails https://www.sportireland.ie/outdoors and http://trails.ie/index.php
- Baseline data from the assessments of other Chapters in this EIAR as well as the design drawings for the proposed development, were also reviewed and informed the impact assessment.
- Site visits were also undertaken to appraise the location and potential impact upon human receptors by the proposed development.
- Information was also obtained from the following sources:
  - Environmental Protection Agency (www.epa.ie).
  - Geohive (http://map.geohive.ie/mapviewer.html).
  - Health and Safety Authority (http://www.hsa.ie/eng/).
  - Pobal (https://maps.pobal.ie/WebApps/DeprivationIndices/index.html).
  - All-Island Research Observatory (AIRO) (https://airo.maynoothuniversity.ie/).
  - https://www.heritagemaps.ie/.

Identification and Description of Potential Effects

5.14 The characteristics of the proposed development were considered and the changes occurring as a result of aspects of the construction and operation of the proposed development were identified. The effect of these impacts on and population and health outcomes (beneficial and adverse) were consequently identified and assessed.

5.15 The assessment of the proposed development focused on those potential impacts most likely to be influenced by the proposed development, namely water, air quality and noise & vibration.

5.16 The population and human health assessment addresses effects at a community level rather than for individuals or identifiable properties, although impacts for individual properties are discussed where these are significant or located within proximity to the proposed development, as appropriate.

5.17 The criteria used to describe the predicted effects across land use, social and health considerations are adapted from Table 3.4 of the EPA Guidelines (EPA, 2022).

Table 5.1
Description of Effects

Description of Effects		
Quality of Effects	Positive Effects	A change which improves the quality of the environment (for example, by increasing species diversity, or improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
	Neutral Effects	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative/Adverse Effects	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem, or damaging health or property or by causing nuisance).
Extent and Context of Effects	Extent	Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
	Context	Describe whether the extent, duration or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)
Probability of Effects	Likely Effects	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Duration & Frequency	Momentary Effects	Effects lasting from seconds to minutes.
	Brief Effects	Effects lasting less than a day.
	Temporary Effects	Effects lasting less than a year.
	Short-term Effects	Effects lasting one to seven years.
	Medium-term Effects	Effects lasting seven to fifteen years.
	Long-term Effects	Effects lasting fifteen to sixty years.
	Permanent Effects	Effects lasting over sixty years.
	Reversible Effects	Effects that can be undone, for example through remediation or restoration.
	Frequency of Effects	Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).
Direct/Indirect	Direct Effects	Effects that are result directly from the proposed development or project.
	Indirect Effects	Defined by the EC as 'Impacts on the environment, which are not a direct result of the project, often produced away from (the site) or as a result of a complex pathway.'
Cumulative Effects	Cumulative Effects	The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects

Significance of Effects

5.18 The assessment process evaluates how the proposed development impacts on baseline environmental and social factors and considers whether the effects that are associated with positive or negative population and health outcomes. The significance of an effect is informed by the description of the effects (table 5.1 above).

5.19 The significance of an effect can be described as follows (based on Table 3.4 of the EPA Guidelines (EPA, 2022)):

Table 5.2
Significance Criteria

Description of Significance of Effects		
Significance	Imperceptible	An effect capable of measurement but without significant consequences.
	Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant Effects	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
	Very Significant	An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
	Profound	An effect which obliterates sensitive characteristics.

Baseline Conditions

Land Use & Property

Land Use

5.20 The site is located in the townland of Barrettspark, situated approximately 13km east of Galway City centre and approximately 7km west of Athenry town centre.

5.21 The site is located approximately 155m to the north of the M6 – Galway – Dublin Motorway. Access to the site is provided via a 1km private access track that enters the site along its northern boundary. The access track joins the L7109, which in turn joins the R339 at a T-junction approximately 1.3km north of the site. In the vicinity of the site the L7019 comprises a marked single carriage road.

5.22 The application site is comprised of an existing operational quarry, which is broadly rectangular in shape with within an overall site area of c 27.5ha. The existing quarry operations comprise extraction of limestone an existing extraction area of approximately 8.4ha using blasting techniques, processing (crushing and screening) of the fragmented rock to produce aggregates. Ancillary facilities:

- Open storage areas;
- Concrete manufacturing facility;
- Maintenance shed;

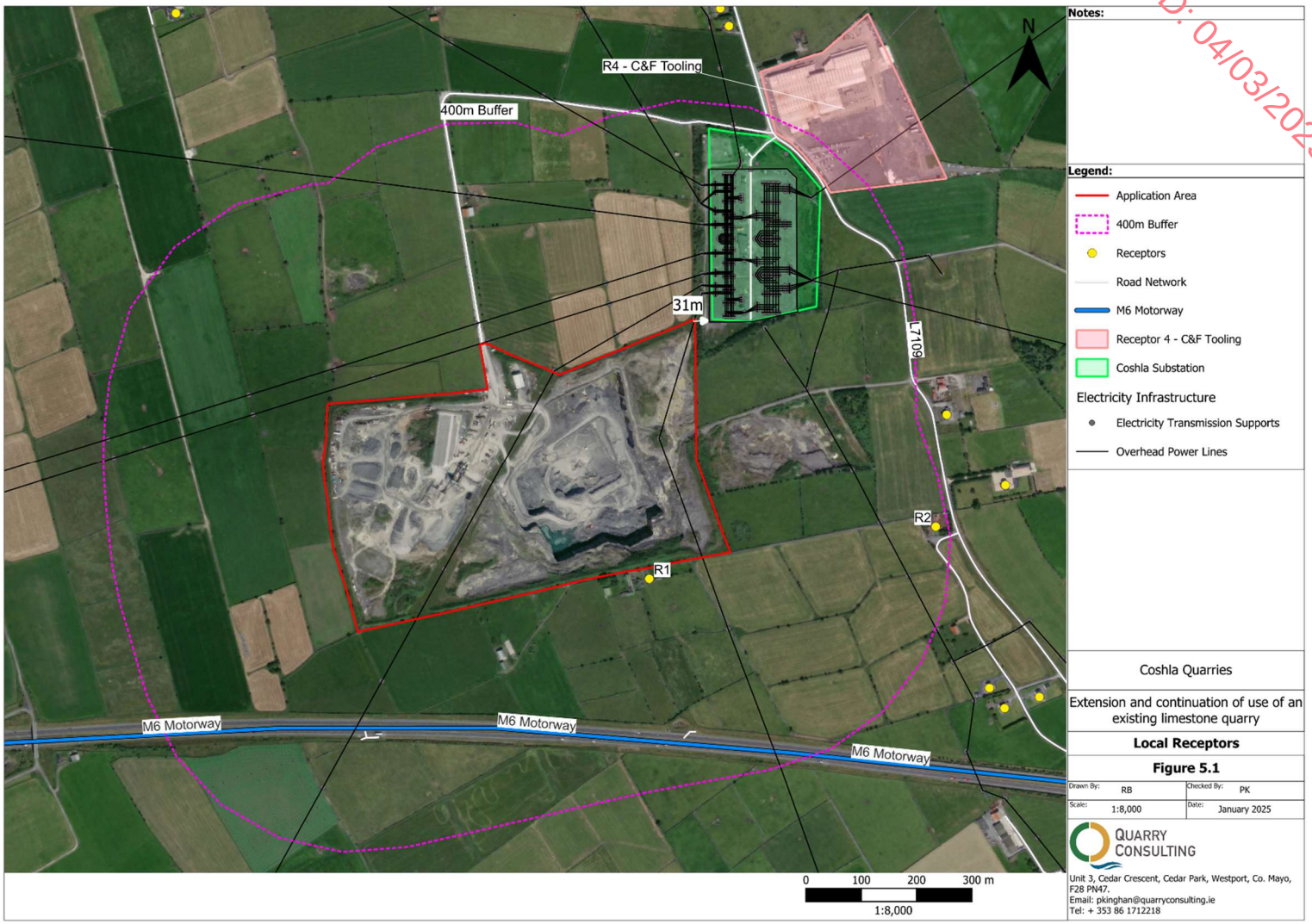
- Water management system;
- Weighbridge;
- Wheelwash;
- Site office, including canteen, staff room & welfare facilities;
- Landscaped and planted berms.

5.23 Landuse in the vicinity of the site comprises a mix of agriculture, industrial and residential. Agricultural uses consist of fields used for pasture enclosed with stone walls or post and wire fencing. Industrial uses include the existing substation immediately north-east of the site and a metal-work company, further to the north-east.

5.24 Residences within the general area typically consist of one-off rural houses and ribbon development along the local road network. The nearest properties to the site comprise one dwelling (uninhabited) situated to the south of the site boundary and three dwellings to the east of the site. There are two dwellings within 400m of the application site (Figure 5.1) and approximately 76 dwellings within 1km of the quarry. The closest settlement to the site is the village of Oranmore, which is situated approximately 5km south-west of the site.

5.25 Tree cover is limited to some field boundaries and occasional conifer plantations, including at Palmerstown approximately 1.6km to the south-east of the site.

Figure 5.1: Local Receptors



Property Values

5.26 The Data available from the CSO on property values is presented in terms of Eircode Routing Key areas. The proposed development is located within Eircode Routing Key H65: Athenry. The CSO data for November 2024 show that the median price of residential properties sold across the area is c.€370,000. The national median house price for November 2024 was €359,000.

Population and Settlement Patterns

5.27 The demographic information for the area has been sourced from the 2011 – 2022 census data, which is available from the Central Statistics Office. Table 5.3 below provides information on the population figures for the eight Electoral Districts within the study area. The information largely paints a picture of an area experiencing population increase, with an overall increase of 8.4% in the population within the Aughrim ED since 2011. This increase is however below both the county figure (10.81% increase) and the national figures (12.22% increase).

Table 5.3
Population Statistics

Area	Population 2011	Population 2016	Population 2022	Change 20011-2022	% Change 2006-2020
Ireland	4,588,252	4,761,865	5,149,139	560,887	12.22%
Galway	250,653	258,058	277,737	27,084	10.81%
Aughrim	1215	1296	1317	102	8.40%
Athenry	4828	5470	5765	937	19.41%
Belleville	576	620	670	94	16.32%
Carnmore	2609	2577	2791	182	6.98%
Greethill	920	999	1086	166	18.04%
Lisheenavalla	1005	1061	1085	80	7.96%
Oranmore	4325	4297	4721	396	9.16%
Stradbally	1207	1218	1186	-21	-1.74%

Source: https://data.cso.ie/

5.28 Information on population density for the area highlights that the population density in Aughrim is almost half of the national average (73), however the adjoining ED's (Athenry and Oranmore) are significantly above the national average (227 and 211 respectively). This highlights the fact that the area is relatively unpopulated, but has easy access to centres of population.

Table 5.4
Population Density

Area	Population Density 2022 (Persons/Km^2)
Aughrim	39
Athenry	227
Belleville	32

Carnmore	145
Greethill	47
Lisheenavalla	62
Oranmore	211
Stradbally	73
State	73

5.29 The age profile of people living in the ED is slightly below, but broadly consistent with the national average. Information from Central Statistics office (2021) indicates that the birth rate of 12.6 for the county has decreased dramatically since 2008 when it was 18.6. This follows the same pattern as has been recorded nationally where the rate has fallen from 17 in 2008 to 11.9 in 2021.

Table 5.5
Age Profile

Area	Average Age (2016)
State	39
Aughrim	38
Athenry	36
Belleville	38
Carnmore	38
Greethill	38
Lisheenavalla	37
Oranmore	38
Stradbally	38

Tourism and recreation

5.30 The National Tourism Development Authority (Fáilte Ireland) periodically collates statistics on overseas visitors to Ireland and regions within the country. Table 5.6 sets out the most recent overseas tourism statistics from 2018 and 2019 for the country and the West region, which includes County Galway. Fáilte Ireland's *Topline Performance by Region* (2017) indicates that that County Galway attracted 1,673,000 overseas visitors making the county the 2nd most popular county for overseas visitors and generating a revenue within the county of €589 million.

Table 5.6
Tourism

Destination	No. of Tourists	Revenue Generated
Ireland (2019)	9.7million	€5.6 billion
Ireland (2018)	9.6 million	€5.6 billion
West Region (2018)	1.96 million	€727 million

5.31 Data from the 2022 Fáilte Ireland *Key Tourism Facts,* indicates that there were 13.3 million domestic trips in 2018. The majority of these domestic trips were recorded as short (1-3 days) holiday trips with trips to visit friends/relatives reported at 34% of all domestic trips. Most of these trips are shown to occur in the late summer period (July – September) with the majority of domestic holidaymakers engaging in hiking/walking (54%).

5.32 The Failte Ireland *Visitors to Attractions Dashboard* provides an overview of visitor numbers to various attractions throughout the country. The nearest attraction included in the survey to the site is the Atlantaquaria – Ireland's National Aquarium in Galway City, which in 2022 attracted 113,697 visitors.

5.33 As stated above, 54% of domestic visitors to the country engage in hiking/walking. The county has an extensive network of trails which provide a recreational resource for both visitors and locals. Much of the hiking trails are focused on the west of the County, including The Western Way and Connemara National Park, however the following trails and loop walks are noted in the study area.

- Athenry Forest Loop
- Oranmore Circular

5.34 Other recreational and community facilities and amenities are available in the towns of Athenry (7km east of the site) and Oranmore (6km south-west of the site). These include GAA clubs, shops, health centre, community hall and churches. Galway City centre is approximately 13km west of the site.

5.35 Public transportation in the area is relatively limited, however Bus Eireann operates bus service no. 425a from Galway City to Mountbellew which runs along the R339 north of the site. Other bus services are available from Oranmore, Athenry and Galway City. The nearest train station is located in Galway City.

Education & Employment

Education

5.36 The nearest national school to the site is Scoil Naomh Mhuire, which is located approximately 1.4km south-east of the site, south of the M6 motorway. The nearest post-primary schools are located in Oranmore and Athenry and comprise Calasanctius College, Clarin College, Coláiste an Eachreidh and Presentation College.

5.37 The nearest third level campus is in Galway City (University of Galway and Atlantic Technological University), located approximately 12km west of the proposed development site.

Employment

5.38 Employment is an important indicator of the economic standing of an area. The Labour Force Survey undertaken by the CSO provides details of unemployment on a regional level. Galway is located in the Western Region.

5.39 Table 5.7 illustrates the findings from the Labour Force Survey published by the CSO. The participation rate in the region is very slightly below the national rate, while the unemployment rate is also below the national rate.

Table 5.7
Unemployment and Participation Rates

Location	Unemployment Rate Q1 2024	Participation Rate Q4 2023
State	4.2%	65.4%
West	3.7%	65.1%

Table 5.8
Sectors of Work in Aughrim and Co. Galway

	Aughrim 2022		Galway 2022	
Sector	**No.**	**%**	**No.**	**%**
Agriculture, forestry and fishing	59	9.32%	4,930	5.74%
Building and construction	39	6.16%	5,844	6.80%
Manufacturing industries	131	20.70%	14,519	16.90%
Commerce and trade	118	18.64%	16,536	19.25%
Transport and communications	42	6.64%	5,669	6.60%
Public administration	38	6.00%	4,399	5.12%
Professional services	141	22.27%	22,962	26.7%
Other	65	10.27%	11,042	12.85%
Total	633	100.00%	85,901	100.00%

5.40 The population in the Aughrim is categorised by sector of employment as per table 5.8. This shows that the majority of individuals are employed in either professional occupations or commerce and manufacturing. Building and Construction accounts for 6.16% of the workforce, which is in line with the county percentage and above the national percentage.

5.41 A breakdown of the principal economic status for western region in comparison to that of the state is provided at Table 5.9. The statistics are broadly similar with a notable exception being the percentage of retired people being over 3% below the national average. By comparison,

Aughrim benefits from a very high percentage of people in full time employment and a correspondingly low rate of unemployment. The percentage of individuals that are unable to work due to a disability or are unable to work due to the need to care for family or relatives are also below the national and regional rates.

Table 5.9
Principal economic status in Western region and Ireland

	Aughrim 2022		West 2022		Ireland	
Status	**No.**	**%**	**No.**	**%**	**No.**	**%**
Employer or own account worker	633	62.24%	32,050	8.18%	308,675	7.46%
Employee			181,122	46.22%	2,008,774	48.56%
Unemployed looking for first regular job	2	0.20%	3,076	0.78%	34,526	0.83%
Unemployed having lost or given up previous job	32	3.15%	16,053	4.10%	176,276	4.26%
Student or pupil	128	12.59%	44,615	11.38%	459,275	11.10%
Looking after home/family	56	5.51%	24,913	6.36%	272,318	6.58%
Assisting relative			292	0.07%	2,848	0.07%
Retired	125	12.29%	69,073	17.63%	657,790	15.90%
Unable to work due to permanent sickness or disability	36	3.54%	17,810	4.54%	189,308	4.58%
Other economic status	5	0.49%	2,897	0.74%	270,62	0.65%
Total	1017		391,901		4,136,852	

Health & Safety

Health Profile

5.42 Health data for individuals is confidential however information from Lenus has been used to establish the baseline health profile of the study area. Lenus has published separate health profiles for the Local Authorities areas in Ireland. The most recent County Health Profiles published date from 2015 and have been used to establish a community health profile for the County Galway area in which the proposed development is situated.

5.43 Key health facts for County Galway include:

- Is the tenth most affluent local authority area nationally.
- The Traveller population of 1.4% is above the national rate of 0.7%.
- Has a low lone parent rate of 9.3% (national 10.9%).
- Has a low birth rate for mothers under 20 years of age at 7.0% (national 12.3%).
- Has the highest incidence rate of male malignant melanoma nationally, but is below average for female malignant melanoma, breast cancer, female colorectal cancer and male and female lung cancer (City and County data).
- Has average or below average mortality for the four main causes of mortality and for all mortalities (City and County data).
- Is below average for male and female deliberate self harm.

5.44 The 2022 census provides information on the percentage of the population that report their health as very good to very bad. Table 5.10 sets out those figures for the study area. These figures illustrate that typically fewer people in the study area report very bad health relative to the state figures (with the exception of Greethill), while the percentage that reported very good health is typically greater than the state figure.

Table 5.10
General Health in the Study Area

Area	Very Good	Good	Fair	Bad	Very Bad	Not stated
Aughrim	58.77%	29.01%	7.59%	1.44%	0.30%	2.89%
Athenry	54.64%	30.79%	7.67%	1.11%	0.29%	5.50%
Belleville	54.78%	33.73%	7.16%	1.19%	0.30%	2.84%
Carnmore	59.19%	27.70%	6.49%	0.64%	0.11%	5.88%
Greethill	62.43%	25.97%	7.27%	0.92%	0.46%	2.95%
Lisheenavalla	60.83%	27.37%	5.35%	1.20%	0.18%	5.07%
Oranmore	59.18%	27.71%	7.24%	1.00%	0.25%	4.62%
Stradbally	63.49%	28.58%	5.40%	0.67%	0.00%	1.85%
State	53.23%	29.66%	8.64%	1.41%	0.33%	6.74%

5.45 The 2022 census provides information on the age profile the population. Table 5.11 sets out the percentage of the population aged 65 and over in comparison to the state figures. The percentage of the population aged 65 and over within the study area is typically below the national figure.

Table 5.11
Percentage of Population Over 65

Area	% of Population over 65
Aughrim	12.20%
Athenry	11.07%
Belleville	14.78%
Carnmore	11.47%
Greethill	15.75%
Lisheenavalla	11.34%
Oranmore	12.62%
Stradbally	12.39%
State	15.08%

Radon

5.46 The application site falls within a High Radon Area. Radioactivity from radon is measured in becquerels per cubic metre (Bq/m^3). The reference level for radon in homes is 200 Bq/m^3. In a High Radon Area more than 10% of homes may have more than the reference level of radioactivity. The acceptable level, or Reference Level, for workplaces in Ireland is 300 Bq/m^3.

Figure 5.2: Radon Map

Assessment of Potential Effects

5.47 The following assessment considers the operational and post-operational stage effects only as there will be no construction phase associated with the proposed development.

Land-use & Property

Operational Stage Impacts

5.48 As the proposed development comprises the continuation of the existing quarry and concrete manufacturing facility, with an extension into lands to the north, east and south, which are already within the overall site boundary and visually coherent with the existing quarry, there would be no discernible change in land-use during the operational phase of the development.

5.49 The proposed development is not predicted to have any impact on the local property values as the area has a long association with quarrying and the quarry is well screened from the majority of residential properties in the area.

Land-use	**Quality**	Negative
	Extent	Existing extraction area c8.4ha, proposed extraction area c.4.6ha
	Probability	Likely
	Frequency	Constant
	Duration	Long-term
	Reversibility	Reversible
	Direct/Indirect	13ha directly affected by extraction. 27.5ha directly affected by quarry related land-uses. Use is however already established at the site.
	Significance	Not significant - *an effect which causes noticeable changes in the character of the environment but without significant consequences.* The proposed development would not significantly alter the nature of the land-use at the site.

Table 5.12: EPA Description of Effects – Land-use, operational phase

Post - Operational Stage Impacts

5.50 Following the cessation of operations, the application site will be restored. This would result in the restoration of the proposed worked-out quarry void to a water body. The remaining overburden would be redistributed to selected locations around the quarry void and allow the quarry sides to revegetate naturally. The land-use would therefore be altered, as outlined in chapter 12 (landscape), the effects of the restored development will not be significant in terms of land-use and property.

Land-use	**Quality**	Positive
	Extent	Total site area 27.5ha.
	Probability	Likely
	Frequency	Constant
	Duration	Long-term
	Reversibility	Reversible
	Direct/Indirect	Total site area 27.5ha directly affected.
	Significance	Not significant - *an effect which causes noticeable changes in the character of the environment but without significant consequences.* The use of the land would be altered, however it would remain as a post-quarried use and allowed to vegetate and the void to fill with water. This would offer significant biodiversity net gain.

Table 5.13: EPA Description of Effects – Land-use, post-operational phase

Population & Settlement Patterns

Operational Stage Impacts

5.51 The continued operation and extension of the quarry and concrete manufacturing facility would not have any effect on the distribution of population within the study area as it does not include a housing element and the number of individuals employed would not be altered.

5.52 Key pathways for potential effects on residential amenity in this instance are air, traffic and noise & vibration. As with potential effects on human health, these pathways (other than traffic) are controlled by thresholds established by planning conditions and continuously monitored at the site. These pathways have also been assessed in the respective chapters of this EIA and it has been determined that there would be no magnitude of change associated with the continuation / extension of the existing quarry and concrete manufacturing facility. The combined effect of these potential effects on amenity is therefore anticipated to be negligible. Given that human beings are considered to be a high sensitivity receptor, it is determined that the overall effect would be "not significant".

5.53 A full assessment/review was carried out on the impact of traffic on the R339 and L7109 and their link capacity (Link Capacity is the assessment of the available carrying capacity of a road based on its characteristics). The assessment concluded that there is spare capacity on both routes in all assessment years.

5.54 There are no proposals to increase the number of employees and hence all staff parking shall continue to be accommodated within the quarry site.

Population	**Quality**	Negative
	Extent	Total site area 27.5ha directly affected. Potential effects on noise and atmosphere may extend beyond site boundaries. Traffic effects would affect the site access and local road network.
	Probability	Likely
	Frequency	Daily – traffic, noise & atmospheric emissions. Vibration – once every 5 weeks (potentially increasing to twice/5weeks during periods of high demand).
	Duration	Long-term
	Reversibility	Reversible
	Direct/Indirect	Total site area 27.5ha directly affected. Potential effects on noise and atmosphere may extend beyond site boundaries. Traffic effects would affect the site access and local road network.
	Significance	Not significant - *an effect which causes noticeable changes in the character of the environment but without significant consequences.*

Table 5.14: EPA Description of Effects – Population-operational phase

Post - Operational Stage Impacts

5.55 Following restoration, the potential effects on air, noise, and traffic would cease owing to the cessation of extraction and restoration operations, the cessation of machinery operation and the growth of vegetation.

5.56 Following the cessation of the proposed works, the appearance of the application site will have been altered. The effects of the restored quarry on population and settlement patterns will not be significant.

Population	Quality	Positive
	Extent	Total site area 27.5ha directly affected. Potential effects on noise and atmosphere may extend beyond site boundaries. Traffic effects would affect the site access and local road network.
	Probability	Likely
	Frequency	Daily – traffic, noise & atmospheric emissions. Vibration – once every 5 weeks (potentially increasing to twice/5weeks during periods of high demand).
	Duration	Short-term
	Reversibility	Reversible
	Direct/Indirect	Total site area 27.5ha directly affected. Potential effects on noise and atmosphere may extend beyond site boundaries. Traffic effects would affect the site access and local road network.
	Significance	Not significant - *an effect which causes noticeable changes in the character of the environment but without significant consequences.*

Table 5.15: EPA Description of Effects – Population-operational phase

Tourism & Recreation

Operational Stage Impacts

5.57 It is not anticipated that the operation of the quarry would have any effect on tourist resources identified above. The existing quarry offers no value for recreational amenity as it comprises private land and it does not contain any paths or recreational facilities.

5.58 The effects of the proposed development would be long-term due to the design life of the proposed development, however the quarrying activity is a long established land use in the area and has not impacted on the tourist amenity of the study area.

5.59 The experience of visitors to Athenry Forest Loop would be unaltered by the proposed development as the site is not visible from the forest. Noise associated with the development would not be heard from within the forest and no dust would reach the forest due to the distance.

Tourism	Quality	Negative
	Extent	Total site area 27.5ha directly affected. Potential effects on noise and atmosphere may extend beyond site boundaries, though not reach existing tourism or recreational resources.
	Probability	Likely
	Frequency	Daily – traffic, noise & atmospheric emissions.
	Duration	Long-term
	Reversibility	Reversible
	Direct/Indirect	Total site area 27.5ha directly affected. Potential effects on noise and atmosphere may extend beyond site boundaries. Traffic effects would affect the site access and local road network.
	Significance	Not significant - *an effect which causes noticeable changes in the character of the environment but without significant consequences.*

Table 5.16: EPA Description of Effects – Tourism-operational phase

Post - Operational Stage Impacts

5.60 Following the cessation of the proposed works, the appearance of the application site will have altered to include a new water body and matured vegetation. The restoration would however have no effect on tourism and recreation as the site would remain in private ownership and not open to the public.

Tourism	Quality	Neutral
	Extent	No effect
	Probability	Unlikely
	Frequency	No effect
	Duration	No effect
	Reversibility	No effect
	Direct/Indirect	No effect
	Significance	Imperceptible

Table 5.17: EPA Description of Effects – Tourism-post-operational phase

Education & Employment

Operational Stage Impacts

5.61 The proposed development will continue to provide employment for up to 12 people directly on-site, in addition to a number of indirect employees including hauliers, sub-contractors, materials suppliers and maintenance contractors. In addition, the proposed development will contribute indirectly to sustaining and developing the local and regional economy through the supply of construction aggregates. This will have greater significance in this area relative to other parts of the country given the relative importance of the construction sector in this area.

5.62 The number of employees would not be altered by this proposed development, however it would sustain the jobs for a longer period of time.

Employment	Quality	Neutral
	Extent	12 people's employment sustained by the proposed development with additional indirect employees.
	Probability	Likely
	Frequency	Constant
	Duration	Long-term
	Reversibility	Reversible
	Direct/Indirect	12 people's direct employment sustained by the proposed development.
	Significance	Imperceptible

Table 5.18: EPA Description of Effects – Employment-operational phase

Post - Operational Stage Impacts

5.63 Following the cessation of operations, the application site will be restored. This would result in the loss of jobs within the quarry and related operations. Some short-term employment would be provided in relation to the aftercare of the restored site.

Employment	Quality	Negative
	Extent	12 people's employment lost following cessation of operations with additional indirect employees.
	Probability	Likely
	Frequency	Constant

	Duration	Long-term
	Reversibility	Reversible
	Direct/Indirect	Direct & indirect
	Significance	Slight

Table 5.19: EPA Description of Effects – Employment-post-operational phase

Human Health & Safety

Operational Stage Impacts

5.64 The operational phase of the development relates to the continued extraction and processing of limestone within the existing and extended quarry area using conventional methods, along with concrete manufacturing. The key pathways for potential effects on human health in this instance are therefore air, noise, water and soil. Baseline information and predictions of future emissions in relation the key pathways associated with the day to day operations of the existing and proposed development have been used as part of the assessment. These can be compared to various thresholds relevant to each element. The threshold is the level below which no detrimental health effects are expected.

5.65 Thresholds for the existing development are established via conditions attached to the original planning permission (06/4125) and the subsequent applications that have been approved for the site.

5.66 The potential effects of continuing / extension of the existing quarry and continuance of use of the concrete facility on land, soils & geology, water, air quality and noise and vibration are set out in chapters 7, 8, 10 and 11 respectively. In addition, each of those potential pathways are monitored at the site and the results are submitted to Galway County Council annually. The site has demonstrated compliance with planning conditions. The assessments in this EIAR have concluded that the continuation and extension of the quarry would not result in any significant adverse effects.

Health & Safety	**Quality**	Negative
	Extent	Total site area 27.5ha directly affected. Potential effects on noise and atmosphere may extend beyond site boundaries. Traffic effects would affect the site access and local road network.
	Probability	Likely
	Frequency	Frequently – traffic, noise & atmospheric emissions. Vibration – fortnightly or monthly.
	Duration	Long-term
	Reversibility	Reversible
	Direct/Indirect	Total site area 27.5ha directly affected. Potential effects on noise and atmosphere may extend beyond site boundaries. Traffic effects would affect the site access and local road network.
	Significance	Not significant - *an effect which causes noticeable changes in the character of the environment but without significant consequences.*

Table 5.20: EPA Description of Effects – Health & Safety-operational phase

Radon gas

5.67 The application site falls within a High Radon Area. Statutory Instrument No.30 (2019 **)** requires employers located in High Radon Areas to test their premises for radon. The acceptable level, or Reference Level, for workplaces in Ireland is 300 Bq/m^3. The EPA protocol for testing workplaces states:

- A workplace is tested by placing one small detector in each occupied room on the ground floor and in the basement.
- Only rooms where a worker spends more than 100 hours per year need to be tested.
- No need to test bathrooms, corridors, storage areas etc.

5.68 Francisa et al (2023) investigated radon concentration in open cast mining work environments and concluded that "*in outdoor workplaces, radon can be considered a low risk to employees' health. The average exposure to radon gas, even in cases where exposure to mineral dust is continuous, did not exceed unsafe values considered by international standards during the measurements*".

5.69 No potential effects on the health of employees working at the site as a result of radon emissions are therefore likely to occur.

Radon Gas	**Quality**	Negative
	Extent	12 employees directly affected with additional indirect employees.
	Probability	Unlikely
	Frequency	Rarely – due to nature of the outside working space at the site.
	Duration	Long-term
	Reversibility	Irreversible
	Direct/Indirect	12 employees directly affected.
	Significance	Not significant - *an effect which causes noticeable changes in the character of the environment but without significant consequences.*

Table 5.21: EPA Description of Effects – Radon-operational phase

Silica Dust

5.70 When rocks containing crystalline silica are cut, crushed, ground, drilled or used in similar industrial processes, dust particles are produced. Some of these particles are very fine – known as respirable crystalline silica or RCS. If high quantities of this very fine RCS dust are inhaled on a regular basis over many years, there is a potential risk that the cumulative effects can cause a lung disease known as silicosis. It is now also accepted that prolonged and intense RCS exposure can cause lung cancer.

5.71 Material that is extracted at the application site comprises Limestone rock, which is then used as aggregates for concrete, blocks, hardcore, farm drainage, earthworks and fill. The typical crystalline silica content of Limestone is less than 5%, as calcium carbonate is the primary chemical compound in the rock and not silica.

5.72 The quarry operator has a legal responsibility to adhere to the HSA Safe Quarry Guidelines to Section 26(b)(ii) of the Safety Health and Welfare at Work (Quarries) Regulations 2008 and the EU Directive on Carcinogens and Mutagens in the Workplace - 2017/2398/EC. This latter legalisation sets an occupational exposure limit of 100 µg/m^3 RCS in industrial workplaces.

5.73 Effective dust prevention, protection and control techniques are already in place at the site, including wheel-washing, spraying and requirements for PPE. No potential effects on the health of employees working at the site as a result of silica dust is therefore likely to occur.

5.74 RCS disperses very rapidly (within 1-10m of origin) and therefore concentrations return to background or near background levels very quickly. As a consequence RCS is only a risk to people working directly at the source and without proper PPE and dust management techniques. RCS does not therefore present a risk to the health of the sensitive receptors in the vicinity of the application site.

Silica Dust	**Quality**	Negative
	Extent	12 employees directly affected with additional indirect employees.
	Probability	Unlikely
	Frequency	Rarely – due to nature of the dust (low silica content)
	Duration	Long-term
	Reversibility	Irreversible
	Direct/Indirect	12 employees directly affected.
	Significance	Not significant - *an effect which causes noticeable changes in the character of the environment but without significant consequences.*

Table 5.22: EPA Description of Effects – Silica Dust, operational phase

Unplanned Events

5.75 According to the EPA guidelines, unplanned events, such as accidents, can include "spill from traffic accidents, floods or land-slides affecting the site, fire, collapse or equipment failure on the site". The 2014 EIA directive refers to "major accidents, and/or natural disasters (such as flooding, sea level rise, or earthquakes)".

5.76 In this instance, the vulnerability of the proposed development to accidents, unplanned events or natural disasters is relatively limited owing to the relatively simple nature of the development works, the established nature of the techniques, regulations and procedures to be followed, the material to be handled on site and the relatively rural location of the proposed works.

5.77 Unplanned events in relation to the proposed development could potentially relate to:

- instability following the extraction of limestone;
- spill from traffic accidents;
- flooding.

5.78 Adhering to the HSA Safe Quarry Guidelines to the Safety Health and Welfare at Work (Quarries) Regulations 2008 should limit the potential for unplanned events in the form of instability in the pit faces. In any event, instability following the extraction of limestone would be unlikely to have any significant impacts on human health beyond the site as there is no public access to the quarry. Therefore, following implementation of the existing and proposed mitigation measures the overall effects are expected to be imperceptible on health and safety in terms of the EIA Regulations.

5.79 Chapter 7 (Land Soil and Geology) and Chapter 8 (Water) note that accidental spillages or leaks of fuels or chemicals during site activities could happen without proper control and supervision. Given the scale of the operation, the probability of spillages occurring is very low.

5.80 The traffic and transport assessment, carried out as part of the EIAR (Chapter 13), indicates that existing road network can continue to accommodate the proposed development. It is considered that the risk of an accident resulting in a spillage from development traffic would be no greater in relation to this development than it is for any other form of development that relies on the transportation of goods and materials by HGVs. The potential for significant impacts on employment, human health in the wider population or amenity as a result of a road spillage is likely to be low and any such effects would be temporary.

5.81 On this basis, it is considered that there would be no likely significant temporary or permanent effects on human health during the operational stage.

Un	**Quality**	Negative

	Extent	Total site area 27.5ha directly affected. Traffic effects would affect the site access and local road network.
	Probability	Unlikely
	Frequency	Rarely – due to existing procedures in place.
	Duration	Long-term
	Reversibility	Reversible
	Direct/Indirect	Total site area 27.5ha directly affected. Traffic effects would affect the site access and local road network.
	Significance	Not significant - *an effect which causes noticeable changes in the character of the environment but without significant consequences.*

Table 5.22: EPA Description of Effects – Unplanned events, operational phase

Post - Operational Stage Impacts

5.82 Following restoration, the potential effects on human health associated with emissions from the site would cease and the site would be restored. Following restoration, the site would remain in private ownership and existing security fencing would be maintained to prevent accidental or deliberate access to the site. The restoration of the site would not have any effect on human health, including silica dust, radon gas and unplanned events.

Unplanned Events	**Quality**	Neutral
	Extent	No effect
	Probability	Unlikely
	Frequency	No effect
	Duration	No effect
	Reversibility	No effect
	Direct/Indirect	No effect
	Significance	Imperceptible

Table 5.23: EPA Description of Effects – Human health, post-operational phase

Cumulative Effects / Synergistic Effects

5.83 In the assessment of cumulative effects other permitted and proposed developments in the surrounding area have been considered where they have the potential to generate cumulative effects with the proposed development. Chapter 2 sets out the methodology for identifying those developments which have the potential to cause cumulative effects. It excluded developments that were already constructed as these are already assessed as part of the baseline. Also excluded were small scale developments that would not have the potential to cause cumulative effects. The following developments were short-listed as having the potential to result in cumulative effects:

- 2560052: For the proposed development within County Galway will comprise: •the replacement ("restringing") of the existing OHL circuit conductor wires with a new higher capacity conductor; •Replace tower in situ at 1no. location;•Retain towers at 3no. locations including foundation strengthening with bar member replacement at 2 locations;•Replace polesets at 15no. locations;•the replacement of insulating and ancillary hardware at structures;•all associated temporary site development works to gain access: **Decision Due Date**: 16/03/2025

- 24260: For the installation of solar panels over the roof of an existing telecommunications cabin on a steel frame (covering an area of 60 sqm to maximum height of 5 meters above ground level) works to consist of all ancillary development works, including steel uprights. Received: 06/09/2024
- 2360948: Retention permission for development at C&F Tooling, Cashla, Athenry, County Galway. Retention planning permission for the following extensions to the existing C&F Tooling premises: • machine shop & canteen (gross floor area - 792m2) • switch room & compressor room (gross floor area - 96 m2) •maintenance garage & stores gross floor area - 673 m2) • monitoring office building (gross floor area - 444 m2) • steel cleaning shop (gross floor area - 62.3 m2) • store (gross floor area - 20.3 m2): Granted 26/06/2024 – Appealed 23/07/2024.
- 23355: To upgrade the existing 220k overhead line between the existing Cashla 220kV Substation in the townland of Barrettspark, Co. Galway, & Tower 138 in the townland of Oughtagh, Co. Galway. The proposed development will consist of refurbishment works to the existing overhead Line (approximately 49 km long & comprising of 138no. steel angle masts). The refurbishment works to towers will consist of: installation of replacement parts on the towers including insulators, shield wire, vibration dampeners, arching horns & anti-climbing guards; associated site development works, including temporary work areas, foundation refurbishment /strengthening & recapping/clearing of shear blocks; clearance of shear block bases; & ancillary works; ancillary site preparation works, site clearance & levelling at the 6no. temporary construction compounds & associated temporary works to existing tracks & new temporary access routes to provide internal access routes to each tower with all associated works required to facilitate the development. No works will be undertaken to the overhead line (conductor). The proposed development will also consist of upgrades to the Cashla 220kV substation that will consist of: the decommissioning and removal of line bay equipment within the substation boundary; construction of a new adjacent offline like for like line bay & associated bay protection cabinets within the substation boundary; & new overhead lines connection between the end mast & the new line bay. Land Use & Property: Further Information Received: 24/07/2024
- 20961: For permission for development at this site at Ballymoneen and Grange East, Co Galway. The development will consist of a planning permission for a period of 5 years to construct and complete a Solar PV Energy and Battery Storage development with a total site area of circa 140.9 Hectares to include a single storey electrical substation building, electrical transformer and inverter station modules, solar PV panels ground mounted on support structures, battery containers and associated infrastructure, internal access tracks, security fencing, electrical cabling/ ducting, CCTV and other ancillary infrastructure, drainage, additional landscaping and habitat enhancement as required and associated site development works including works related to the access to the site. The solar farm would be operational for 35 years. Gross floor space of proposed development: 1886.39 sqm. Approved Conditional: 22/01/2021
- 2261105: To construct and complete a solar pv energy development with a total site area of circa 24.51 hectares, to include electrical transformer and inverter station modules, solar pv panels ground mounted on support structures, internal access tracks, security fencing, electrical cabling and ducting, cctv and other ancillary infrastructure, drainage, additional landscaping and habitat enhancement as required and associated site development works, the solar farm would be operational for 35 years, access will be gained from a private lane off the l-7117 to the northeast, this access point and part of the internal access track is within the red line boundary of the consented ballymoneen

solar farm application (planning ref: 20/961).Gross floor space of proposed works 768.00sqm. Approved Conditional: 07/03/2023.

- 181883 / ABP-304922-19: for a ten-year planning permission for the development of an up to 100MW Battery Energy Storage Facility that will provide energy services to the national grid and will be delivered in 4 no. phases. The development will consist of the construction and operation of up to 34 metal containers to store up to a project total of up to 100MW in sealed battery cells each with entrances, fire suppression systems, heating, ventilation and air conditioning systems. The proposed development includes for inverters, control systems, other electrical components, security lighting and ancillary infrastructure and all associated works including security fencing and ancillary grid infrastructure. Gross floor space of proposed works: 2186.6 sqm: Granted conditional 21/06/2019: Appeal granted: 12/11/2019
- 15488 / ABP-07.245518: to construct the following: a 24,505sqm single storey data centre building, a 5232sqm single storey Logistics and Administration Building, a 289sqm single storey Maintenance Building, a 16sqm Security Hut and associated barriers, 2 number 48sqm Fibre Huts (max building eaves height = 10m), 18 external standby generators, all associated external plant, a 20kV Electricity Substation, contractor facilities, a main entrance including a new right turning lane, internal access roads and associated infrastructure, proprietary waste water treatment plants including percolation areas, mains water connection, fire water storage tanks; rainwater harvesting, provision of fibre optic data connections, car parking (207 spaces, including 7 visitor spaces, 50 internal staff mobility spaces and disabled parking spaces), bike parking, an amenity walkway and associated parking, site leveling for a laydown area and a 220kV substation, 2.4m high perimeter security fencing, landscaping including supplementary tree planting and all associated works. A report for screening for Appropriate Assessment and an Environmental Impact Statement (EIS) will be submitted with the planning application (gross floor space 30,138sqm) Granted 09/09/2015 – Appealed 22/09/2015. Appeal granted 11/08/2016

Land Use & Property

5.84 There are no potential cumulative effects of the proposed development with other developments on property. The ownership of the above developments would not be affected by the proposed development.

Population and Settlement Patterns

5.85 All of the above developments would result in traffic (associated with construction phases) onto either the L7109 and the R339, particularly if construction phases occurred concurrently. The potential effects of this have been assessed in chapter 13: Traffic, which has concluded that no potential cumulative effects due to traffic are likely.

5.86 Population and settlement patterns would also not be altered if all developments were permitted.

Tourism & Recreation

5.87 No significant adverse cumulative effects on tourism or recreation are anticipated due to the construction or operation of the above developments as they are distant from tourist and recreational resources.

Education & Employment

5.88 Given the nature of the applications listed above, employment numbers are likely to be minimal and therefore potential cumulative effects are likely to also be minimal.

5.89 All of the above development would result in traffic (associated with construction phases) onto either the L7109 and the R339, particularly if construction phases occurred concurrently. The potential effects of this have been assessed in chapter 13: Traffic, which has concluded that no potential cumulative effects due to traffic are likely.

Do Nothing Scenario

5.90 Under the 'do-nothing' scenario, Coshla Quarry would continue to operate the quarry and concrete facility as permitted under existing permissions.

5.91 In the short-term period, there would be no change in the operations at the site and consequently no changes in emissions to soil, water, air or noise and vibration. In the medium term the quarry would be forced to close and there would be a reduction in emissions associated with the operation of the quarry, which would correspondingly result in a reduction in any potential effects on human receptors.

5.92 However the opportunities for local employment and the associated revenue within the local economy would not be realised. Furthermore, there would be a reduction in the volume of material available to the construction sector locally. The do-nothing scenario could result in pressure for alternative, less suitable locations being proposed for quarries to address this short-fall in supply.

Transboundary Impacts

5.93 It is not anticipated that the impacts of the proposed development would have any significant transboundary effects on population and human health.

Interaction with Other Impacts

5.94 It is not anticipated that the effects of the proposed development on population and human health would interact significantly with other impacts.

Mitigation Measures

5.95 Reference should be made to the following chapters of this EIAR for detailed mitigation measures to address the potential pathways for effects on population and human health.

Chapter 7:Land, Soils and Geology.

Chapter 8: Water.

Chapter 9: Climate.

Chapter 10: Air Quality.

Chapter 11: Noise.

Chapter 12: Landscape.

Chapter 13: Traffic.

Chapter 15: Material Assets.

5.96 The following additional mitigation measures are proposed:

Radon

- Periodic workplace testing will be undertaken in accordance with the guidelines set out in the Protocol for Measurement of Radon in Homes & Workplaces, EPA, 2019.

Silica Dust

- Existing health and safety policies and procedures will continue to be reviewed and updated to ensure it is in keeping with best practice and current legislation.

Unplanned Events

- Existing emergency procedures will continue to be reviewed and updated to ensure it is in keeping with best practice and current legislation.

Post - Operational Stage Impacts

5.97 The majority of effects of the proposed development will diminish or cease following the cessation of operations. No specific mitigation measures are proposed in relation to the post operational phase.

Residual Impact Assessment

Operational Stage Impacts

5.98 Following the implementation of mitigation measures identified above and in other chapters of this report, no residual impacts on population and human health are anticipated in the operational phase of the development.

Post-Operational Stage Impacts

5.99 Following the implementation of mitigation measures identified above and in other chapters of this report, no residual impacts on population and human health are anticipated in the post-operational phase of the development.

Monitoring

5.100 As outlined in 8 (water), 10 (air quality) and chapter 11 (noise), of this EIAR monitoring in relation to the proposed development will be undertaken in respect of water, air and noise and vibration. On this basis, no specific monitoring is required in relation to population and human health.

Environmental Monitoring Programme: refer also to Chapter 17: Mitigation and Monitoring

5.101 Monitoring will continue to be carried out on a regular basis, to demonstrate that the development is not having an adverse impact on the surrounding environment.

Dust Monitoring

5.102 Dust deposition monitoring will be carried out at the application site – refer to Chapter 10. Dust monitoring locations shall be reviewed and revised where necessary. The results of the dust monitoring will continue to be submitted to Galway County Council on a regular basis for review and record purposes.

Noise & Vibration Monitoring

5.103 Noise and vibration monitoring will continue to be carried out at the application site – refer to EIAR Chapter 11. Noise and vibration monitoring locations shall be reviewed and revised where necessary. The results of the noise monitoring will continue to be submitted to Galway County Council on a regular basis for review and record purposes.

Water Monitoring

5.104 Surface water and groundwater monitoring at the quarry site will continue in line with the water discharge licence (W/469/13) for the site.

Difficulties Encountered

5.105 No significant difficulties were encountered.

References

Diego Diegues Francisca,Wilson Siguemasa Iramina , Anna Luiza Marques Ayres da Silva * and Giorgio de Tomi; *New Evaluation Method of Exposure to Radon Gas in Mining Environments* (June 2023). Minerals. 2023, 13, 897.