5. POPULATION & HUMAN HEALTH

5.1 Introduction

5.1.1 Background & Objectives

As reported in Chapter 4, the assessments in this rEIAR address the environmental impacts of peat extraction activities and all ancillary works occurring at the Application Site. The assessments in this chapter will determine the any likely significant effects that occurred on population and human health (or are likely to occur) during three differing timeframes termed 'phases' (as described in Chapter 4):

- **Peat Extraction Phase**: peat extraction activities and all ancillary works at the Application Site from July 1988 to the cessation of peat extraction in June of 2020 (July 1988 – June 2020). The Peat Extraction Phase is described in detail in Sections 4.4 to Section 4.7 in Chapter 4.
- **Current Phase**: the management of the Application Site since June 2020 (June 2020 to present). The Current Phase is described in detail in Section 4.8 of Chapter 4.
- **Remedial Phase**: the activities intended to be carried out at the Application Site into the future. The Remedial Phase is described in detail in Section 4.9 of Chapter 4.

The assessment on population considers the current and historical land use of the Application Site, the current activities occurring within and in the vicinity of the Application Site, and their impacts, if any, on local population and employment. The assessment on human health includes literature review of health impact assessment and the EIA process and a review of the past, current and future activities on air quality, dust, noxious emissions, water quality, traffic and transport and general health and safety.

Further discussion on environmental impacts are addressed in more detail in the following chapters: Chapter 7 Land Soil and Geology, Chapter 8 Hydrology and Hydrogeology, Chapter 9 Air Quality, Chapter 10 Climate, Chapter 11 Noise, Chapter 12 Landscape and Visual, Chapter 13 Cultural Heritage, Chapter 14 Material Assets (including Traffic and Transport) and Chapter 15 Vulnerability to Major Accidents and Natural Disasters.

5.1.2 Statement of Authority

This section of the rEIAR has been prepared by Karen Mulryan, Ellen Costello and Natalia Stolarska and reviewed by Sean Creedon, all of MKO. Karen is an Environmental Scientist with MKO with over 7 years' experience in the private consultancy sector. Karen holds a BA and a MSc in archaeology. Karen has a wide range of experience in the commercial sector including watching briefs, surveys and desk-based assessments for a wide range of projects including wind farms, solar farms, energy storage facilities, grid routes, mixed use and residential developments. Karen coordinates environmental assessments and site work for a wide range of developments such as solar, residential, energy storage, small wind projects. Karen has experience coordinating and managing Environmental Impact Assessment Reports, feasibility studies and screening reports. Ellen Costello is a Senior Environmental Scientist with MKO with over four years of experience in private consultancy. Ellen holds a BSc (Hons) in Earth Science, and a MSc (Hons) in Climate Change: Integrated Environmental and Social Science Aspects where she focused her studies on renewable energy development in Europe and its implications on environment and society. Ellen has been involved in a range of renewable energy infrastructure projects. In her role as a project manager, Ellen works with and co-ordinates large multidisciplinary teams including members from MKO's Environmental, Planning, Ecological and Ornithological departments as well as sub-contractors from various fields in the preparation and production of EIARs. Ellen is a Practitioner Member of the Institute of Environmental Management & Assessment. Natalia Stolarska is a Graduate Environmental Scientist with MKO. Natalia holds a BSc in Earth and Ocean Science and an MSc in Environmental Leadership. Natalia's key strengths and areas

of expertise are in drafting EIAR report chapters, environmental impact assessment screening reports, wind farm feasibility studies and QGIS mapping. Since joining MKO in September 2023, Natalia has been involved as a Graduate Environmental Scientist in a range of wind farm projects, assisting with field work, client briefing notes, constraints mapping and drafting EIAR chapters, with more projects in the pipeline.

Sean is an Associate Director in the Environment Team at MKO. He oversees a team of highly skilled environmental professionals working on EIAR for large-and medium scale Renewable Energy infrastructure. Sean has directed and overseen multiple renewable energy projects across wind, solar, battery and hydrogen as well as a range of thermal and other energy related developments. He has worked on the planning and environmental impact elements within all stages of wind farm project delivery. He is a member of the MKO senior management team responsible for developing the business, mentoring team members, fostering a positive culture and promoting continuous employee professional development. Sean has over 22 years' experience in program and project development, holds an MSc from NUI Galway and a Diploma in Project Management from Institute of Project Management Ireland.

5.2 Methodology

As per Article 3 of Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/52/EU:

> *"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****;*
> *(b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;*
> *(c) land, soil, water, air and climate;*
> *(d) material assets, cultural heritage and the landscape;*
> *(e) the interaction between the factors referred to in points (a) to (d).*
>
> *2. The effects referred to in paragraph 1 on the factors set out therein shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned."*

A publication by the European Commission (EC), Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (2017), outlined that:

> *"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."*

This chapter will follow this EC guidance and will examine the health effects relevant to the Project as they relate to a relevant, defined study area. The effects of the Project on the population and human health are assessed in compliance with the requirements of the EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022).

The study area for this assessment is defined as the Electoral Divisions (ED) within which the Application Site is located, namely Ballyhealy (CSO ED code 237011), Copperalley (CSO ED code 237034), Cloghbrack (CSO ED code 167019), Killaconnigan (CSO ED code 167046), Killyon (CSO ED code 167051), Riverdale (CSO ED code 237091), Ballynaskeagh (CSO ED code 237015) and Bracklin (CSO ED code 237019) (hereafter referred to as 'Study Area') The assessment also refers to county and national statistics. The term 'District Electoral Division' was changed to 'Electoral Division' by Section 23 of the Local Government Act, 1994 with effect from 24 June 1996 (S.I. 196 of 1996 refers) [1]. The EDs which define the Study Area are the same District Electoral Divisions which define the Study Area prior to taking effect of S.I. 196 of 1996.

The EPA 2022 EIAR Guidelines advise that "*in an EIAR, 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 this EIAR e.g., under the environmental factors of air, water, soil etc.*" Environmental impacts which have arisen from historic peat extraction activities and all ancillary works which may also have an impact on population and human health are discussed in this chapter and addressed in further detail in the following chapters as appropriate: Chapter 7 Land Soil and Geology, Chapter 8 Hydrology and Hydrogeology, Chapter 9 Air Quality, Chapter 10 Climate, Chapter 11 Noise and Vibration, Chapter 12 Landscape and Visual, Chapter 13 Cultural Heritage, Chapter 14 Material Assets (including Traffic and Transport), and Chapter 15 Vulnerability to Major Accidents and Natural Disasters.

A desk-based assessment using sources referenced in Section 5.2.1 below was undertaken to examine relevant information pertaining to the assessment of the potential for any likely significant effects on population and human health. The effects of peat extraction activities and all ancillary works on the human environment are assessed in compliance with the EIAR Guidelines as outlined in Chapter 1 (Introduction).

As discussed in Chapter 1, neither the EIA Directive nor the Habitats Directive has retrospective effect. There was, therefore, no legal requirement for EIA, screening for EIA or Appropriate Assessment in respect of any project prior to the latest dates for transposition of the Directives. In the case of the EIA Directive, the required date for transposition was 3rd July 1988. In the case of the Habitats Directive, the required date for transposition was 10th June 1994. Owing to being the earliest transposition date, and in light of the non-retrospective effect of the Directives, the assessment period of the potential for any likely significant effects on human health and population commences as of July 1988.

To inform the desk-based assessment, OSI mapping, including historical 6" (mapped years 1829-1841[2]) and 25" (mapped years 1897-1913) maps, were reviewed, as well as available aerial photography of the site. Information on population statistics, employment and social data for the relevant EDs were obtained from the Central Statistics Office (CSO) for census years 2022, 2016, 2011,2006, 2002, 1996, 1991 and 1986. While a census was not completed in the baseline assessment year of 1988, it is considered that census data for 1986 is representative of the baseline environment in 1988. Fáilte Ireland's *EIAR Guidelines for the Consideration of Tourism and Tourism Related Projects* was also considered in this assessment.

5.2.1 Relevant Guidelines

As referenced in the Department of Housing, Planning and Local Government (2018) *Guidelines for Planning Authorities and An Bord Pleanála*, (taken from the European Commission's Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment

[1] *Census 2022 Small Area Population Statistics https://www.cso.ie/en/census/census2022/census2022smallareapopulationstatistics/#:~:text=For%20Census%202022%2C%20the%20CSO,data%20for%203%2C420%20Electoral%20Divisions.&text=The%20term%20District%20Electoral%20Division,196%20of%201996%20refers).*

[2] https://www.tailte.ie/en/surveying/products/professional-mapping/historical-maps-and-data/

Report (2017)), human health is, "*a very broad factor that would be highly project dependent.*" The report continues:

> *'*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.'*

Environmental Protection Agency EIAR Guidelines

In 2022 the Environmental Protect Agency published EIAR Guidelines (the Guidelines) which state that "*while no specific guidance on the meaning of the term Human Health has been issued in the context of Directive 2014/52/EU, the same term was used in 3.3.6 the SEA Directive (2001/42/EC). The Commission's SEA Implementation Guidance states 'The notion of human health should be considered in the context of the other issues mentioned in paragraph (f)'*" of the Directive, environmental factors such as soils, water, landscape, air etc. The Guidelines state that this approach is '*consistent with the approach set out in the 2002 EPA Guidelines where health was considered through assessment of the environmental pathways through which it could be affected, such as air, water or soil*'. The Guidelines note that the above approach follows the 2002 EPA guidelines already in place which details the following:

"*The evaluation of effects on these pathways 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".*

The 2022 EPA Guidelines state that "*assessment of other health & safety issues are carried out under other EU Directives, as 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 Directives48. In keeping with the requirement of the amended Directive, an EIAR should take account of the results of such assessments without duplicating them*". This rEIAR is accompanied by Annual Environmental Reports (AER) prepared by the Bord na Móna (the Applicant) and submitted to the EPA in compliance with Integrated Pollution Control (IPC) licence requirements. Please see Appendix 4-3 for the most up to date 2023 AER.

IEMA Guidance 2017

The Institute for Environmental Management and Assessment (IEMA) published 'Health In Environmental Impact Assessment: A Primer for a Proportionate Assessment' in 2017 examining what a proportionate assessment of the impacts on health should be in Environmental Impact Assessments. The document. The document states that Health Impact Assessment (HIA) and EIA are separate processes.

> '*HIA is defined as a combination of procedures, methods and tools that systematically judges the potential, and sometimes unintended, effects of a policy, plan, programme or project on both the health of a population and the distribution of those effects within the population. HIA identifies appropriate actions to manage those effects... [...] ... HIA can inform EIA practice in relation to population and human health but conducting a HIA will not necessarily meet the*

EIA population and human health requirement. By the same token, conducting an EIA will not automatically meet the requirements of a HIA.'

The Primer Assessment Report acknowledges that 'disproportionate burdens maybe placed on developers if HIA is applied as a proxy for the consideration of population and human health in every future UK EIA'. The focus of EIA should be on predicting health and wellbeing outcomes, rather than focusing on changes in determinants of health e.g., expected changes in noise levels. *Determining the significance of impacts on* population and human health should include a professional judgement, scientific literature; consultation responses; comparison with baseline conditions; local health priorities; and national/international regulatory standards and guidelines. The primer report refers to the WHO 2014 which provides and overview of health in different types of assessment:

"*The health sector, by crafting and promoting HIA, can be regarded as contributing to fragmentation among impact assessments. Health issues can, and need to, be included [in impact assessment] irrespective of levels of integration. At the same time, from a civic society perspective, it would be unacceptable for HIA to weaken other impact assessments. A prudent attitude suggests optimizing the coverage of health along all three avenues:*

- *Better consideration of health in existing impact assessments other than HIA;*
- *Dedicated HIA; and*
- *Integrated forms of impact assessment."*

As such, the WHO does not support a stand-alone HIA unless it could be demonstrated to be of advantage over an EIAR. Therefore, given that this human health assessment is part of the EIAR; there is no stand-alone HIA.

EIA Significance Matrix for Human Health, IEMA Guidance 2022

The IEMA Working Group 2022 published '*Determining Significance For Human Health In Environmental Impact Assessment'* in response to gaps and inconsistencies across existing guidance documents as to how health is assessed in EIA, particularly with regard to significance. The aim of this report is to assist and streamline discussions for consultants producing the assessments and for the decision makers who are reviewing the assessments. The report states that an EIA must identify, describe and assess the direct and indirect significant effects in an appropriate manner of a proposed development on human health. It must include the information that may reasonably be required for reaching a reasoned conclusion on the significant effects, taking into account current knowledge and methods of assessment.

The assessment of the impact on human health was carried out using guidelines set out in Section 5.2.1 above. The effects of the peat extraction activities and all ancillary works on the human environment are assessed in compliance with the EIAR Guidelines as outlined in Chapter 1 (Introduction). Environmental Impacts from the Peat Extraction Phase, Current Phase and Remedial Phase which may also have an impact on population and human health are discussed in this chapter but addressed in more detail in the following chapters: Chapter 7 Land Soil and Geology, Chapter 8 Hydrology and Hydrogeology, Chapter 9 Air Quality, Chapter 10 Climate, Chapter 11 Noise and Vibration, Chapter 12 Landscape and Visual, Chapter 13 Cultural Heritage, Chapter 14 Material Assets (including Traffic and Transport) and Chapter 15 Vulnerability to Major Accidents and Natural Disasters.

Additionally, the following guidelines, plans and reports have informed the preparation of this chapter:

- Department of Housing, Planning and Local Government (DoHPLG), Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018)
- European Commission (EC), Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (2017)

- Department of the Environment, Heritage and Local Government Wind Energy Development Guidelines (2006)
- Environmental Impact Assessment of National Road Schemes- A Practical Guide, National Roads Authority/ Transport Infrastructure Ireland, Revision 1, November 2008;
- Failte Ireland EIAR Guidelines for the Consideration of Tourism and Tourism Related Projects (2023)
- Health Impact Assessment Resource and Tool Compilation, United States Environmental Protection Agency 2016
- Health Impact Assessment Guidance, Institute of Public Health Ireland. 2009
- Framework for Human Health Risk Assessment to Inform Decision Making developed by the United States Environmental Protection Agency (US EPA). 2014
- Institute for Environmental Management and Assessment (2017) Health In Environmental Impact Assessment: A Primer for a Proportionate Assessment
- Institute for Environmental Management and Assessment (2022) Determining Significance for Human Health in Environmental Impact Assessment
- Central Statistics Office (CSO): Census of Ireland 2022; Census of Ireland 2016; Census of Ireland 2011;
- Meath County Development Plan 2021-2027;
- Two Year Progress Report on Meath County Development Plan 2021-2027 (2023)
- Westmeath County Development Plan 2021-2027;
- Historic County Development Plans for County Meath and County Westmeath dated from 1981 onwards, along with the Ballivor Development Plan for 1993 (details of which are provided for in Section 2.3.4 in Chapter 2 of this rEIAR).
- Bord na Móna socio-economic report 2017/2018;
- Fitzpatrick Associates, 2011 Energy Crop-Socio-economic Study, Bord na Móna;
- Central Statistics Office Population Change and Historical Perspective. www.CSO.ie

The assessment of the potential for any likely significant effects on population and human health has been undertaken in accordance with Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/52/EU and as transposed into Irish Law through Regulations in 2018 (S.I. No. 296 of 2018).

5.2.2 Scoping

Fáilte Ireland

A scoping request was sent to Fáilte Ireland on 2nd December 2021 and a response was received on the 9th of the same month. A summary of the response is provided in Chapter 2 Section 2.6 of this rEIAR, and a copy of the response is provided in Appendix 2-1.

The response included a copy of *Fáilte Ireland's EIAR Guidelines for the Consideration of Tourism and Tourism Related Projects*. The guidelines state that construction and operation of developments can result in an increase in population levels to the area through new economic opportunities and the provision of new facilities such as tourism and recreational amenities. Changes in population can impact the perception of pace of life or safety in a particular location. Impacts upon these issues in areas which rely heavily on tourism or have a particular sensitive tourism generator should be considered. Construction and operation of developments can also cause air and noise, pollution and increase traffic levels. The Failte Ireland guidance document also includes sources of useful information which were considered in this chapter e.g., Failte Ireland website and the Census database.

Owing to the passage of time between the initial scoping request in December 2021 and the preparation of this rEIAR, a subsequent scoping request was issued to Fáilte Ireland on 14th February 2024. At the time of writing this rEIAR in July 2024, no response had been received. Nonetheless, the issues raised by Fáilte Ireland in their initial scoping response have been considered in this chapter.

Health Service Executive (HSE)

A scoping request was sent to the HSE on 7th December 2021 and a response was received on the 22nd of the same month. A summary of the response is provided in Chapter 2 Section 2.6 of this rEIAR, and a copy of the response is provided in Appendix 2-1.

The HSE response states that the scoping document submitted by MKO on 2 December 2021 was studied and it is "*satisfied that the Scoping Document identifies the potential environmental effects (listed above) of the project which will be addressed in the rEIAR.*"

Owing to the passage of time between the initial scoping request in December 2021 and the preparation of this rEIAR, a subsequent scoping request was issued to the HSE on 14th February 2024. At the time of writing this rEIAR in July 2024, no response had been received. Nonetheless, the issues raised by the HSE in their initial scoping response have been considered in this chapter.

5.2.3 Assumptions and Limitations

Assumptions made and limitations to the production of this chapter include the following:

- Limited 1988-specific data to inform the baseline on population levels, household statistics and employment for the study area of this assessment. The 1986 Census baseline data was used for the baseline data, which is considered to be representative of the 1988 environment;
- No health data was included for Census results prior to Census 2011;
- In the absence of detailed information, assumptions have been made on the location of certain existing infrastructure such as rail lines in order to inform the baseline description. These assumptions have been made utilising available aerial imagery.

5.3 Establishment of Baseline (July 1988)

Section 5.2 outlines the clear reasoning for establishing the baseline for this assessment as 1988 (i.e. 3rd July 1988 being the required transposition date of the EIA Directive). This section outlines the baseline environment at that time, specifically as related to population and human health. No Census data were collected in 1988. Census data were collected in 1986, two years prior to the baseline year of 1988. Census data from 1986 have been used to establish the 1988 baseline for this assessment, as the 1986 data are considered representative of the July 1988 environment. For a comprehensive list of activities carried out on site from 1988 to the present day please see Chapter 4 Description.

5.3.1 Landcover and Land use

In 1988, most of the drainage was already inserted, permanent railway lines were laid down and peat extraction was underway on each of the bog units of the Application Site, with the exception of Lisclogher West, where despite the installation of drainage, peat extraction never took place. Several storage, welfare and peat processing buildings were already established at Ballivor Works to the north of Ballivor Bog, adjacent to the Application Site (see Chapter 2 for a full planning history of the Application Site).

Existing onsite infrastructure by 1988 included:

- railway infrastructure (all bogs except Lisclogher-West); and,
- internal machine passes/tracks (all bogs)

Adjacent to the Application Site at Ballivor Works:

- Bulk Loading Facility at the Works of R156 in Ballivor Bog (Planning Grant 1983);

- Workshop and extension at the Works of R156 in Ballivor Bog (Planning Grant 1977);
- Covered Loading Bay at the Works of R156 in Ballivor Bog (Planning Grant 1972); and,
- Silt ponds and drains.

The landcover in 1988 predominantly comprised bare cutaway peat. Around the edges of the bogs and in Lisclogher-West, the Application Site comprised a mix of re-vegetated peat, degraded blanket bog, scrub, low woodland, remnants of high bog and a very small area of conifer plantation.

The five no. bogs of the Application Site were separated by the local road network, woodland, linear strips of agricultural land and residential properties. The bogs were inter-connected by a railway that serviced peat extraction activities. Although these differing bogs had their own distinctive landscape attributes (e.g., scale, shape, and orientation), the general character of the landscape at the time was very similar within each bog except Lisclogher-West Bog. Please see Chapter 4 Description for more details on the 1988 baseline.

5.3.2 Baseline Population

The 'Study Area' for this assessment is defined using the following District Electoral Divisions/ Wards which have been identified from Census 1986 Results, the boundaries of which are equivalent to the following Electoral Divisions today:

- Ballyhealy (CSO ED code 237011);
- Copperalley (CSO ED code 237034);
- Cloghbrack (CSO ED code 167019);
- Killaconnigan (CSO ED code 167046);
- Killyon (CSO ED code 167051);
- Riverdale (CSO ED code 237091);
- Ballynaskeagh (CSO ED code 237015); and,
- Bracklin (CSO ED code 237019).

The above District Electoral Divisions/Wards fall under the Trim Rural District in Meath and the Delvin Rural District in Westmeath, as identified in Table 13 of Census 1991 which presents the 1986 population results[3].

Population data for the Study Area, Counties Meath and Westmeath and the State from the 1986 Census, which is considered representative of the baseline year of 1988 are presented in Table 5-1 below.

Table 5-1 Population Levels from 1986 Census

Area	Population Levels in 1986 Census
State	3,540,643
County Meath	103,881
County Westmeath	63,379
Study Area	2,787

[3] https://www.cso.ie/en/media/csoie/census/census1991results/volume1/C1991_V1_T13.pdf

5.3.3 Employment and Economic Activity

Employment figures for the Census year 1986 were used to inform the employment baseline for 1988. While national and county employment figures are available for from the 1986 Census [4], figures for the individual District Electoral Divisions/ Wards which make up the Study Area are not available from the CSO. Please see Table 5-2 below for national and county employment figures from the 1986 Census.

Table 5-2 Employment Figures for National and County Levels from 1986 Census

Area	Employment Figures in 1986 Census
State	1,091,155
County Meath	30,969
County Westmeath	19,318

5.3.3.1 Bord na Móna Employment

For the period of 1988 – 1989 average employment at Bord na Móna was 3,835, with peak employment being 5,116[5].

The 1986 Census has classified employment figures by Industrial Groups, with the 'Mining, Quarrying and Turf Production' [6] industry group being relevant to Bord na Móna employment. National and county figures under this industrial group are presented in Table 5-3 below.

Table 5-3 Mining, Quarrying and Turf Production Industry Employment Figures from Census 1986 (1988 Baseline)

Area	Employment Figures in Mining, Quarrying and Turf Production Industry in 1986 Census
State	8,367
County Meath	1,034
County Westmeath	454

5.3.3.2 Employment at the Application Site

Employment figures at the Application Site for the year 1988 are estimated at 80 permanent employees and 20 seasonal employees.

The earliest employment figures available for the Derrygreenagh Bog Group, in which the Ballivor Bog Group and thus the Application Site are located, are from 1999 and indicate a total of 96 permanent and 31 seasonal employees for the wider bog group. Production operated during the production season, 7 days per week at 12-15 hours per day, weather permitting.

[4] https://www.cso.ie/en/media/csoie/census/census1986results/volume6/C_1986__V_6_T11.pdf
[5] *Donal Clarke (2010) Brown Gold: A History of Bord na Móna and the Irish Peat Industry*
[6] https://www.cso.ie/en/media/csoie/census/census1986results/volume6/C_1986__V_6_T11.pdf

5.3.4 Services

The nearest village to the Application Site in 1988 was Ballivor, which is located 2.2km to the east of the Application Site in County Meath. The village provided a range of services such as educational, recreational, places of public worship and retail. Further services were also found in the villages of Delvin and Raharney, 2.5 km north-northwest and 3.7km to the west of the Application Site, respectively. The available OSI historical 25" mapping indicates that by the 1900s, religious, educational, judicial and retail services were already established in Ballivor Village. It is therefore considered that at a minimum, these services were well established in the village by 1988.

5.3.5 Education

The nearest school to the Application Site boundary in 1988 was Coolronan National School (established 1959) in present day Cloghbrack ED (Cloghbrack DED/ Ward in 1988), located approximately 1.3 km southeast of the Application Site. Columba College in Killucan, established in 1948 was the nearest Secondary school to the Application Site in 1988, located approximately 5km southwest of the Application Site.

5.3.6 Access and Transport

Aerial imagery from 1988 indicate that present day site entrances were also in existence in 1988. Aerial imagery from 1988 also indicates that the bogs were interconnected via rail lines which traversed the local road network between Lisclogher and Bracklin Bogs and Carranstown and Ballivor Bogs.

In 1988, the main entrance point to the Application Site was from the Ballivor-Raharney road (designated the R156 in 1993) which runs in an east-west direction through the Application Site separating Ballivor Bog from Carranstown Bog. Historical mapping indicates this road was in situ since at least the 1840s. Aerial imagery indicates both the main entrances were inserted off the R156 by 1973. The Application Site was also accessed by several local roads to the north, south, east and west. A local road ran northwest to southeast separating Lisclogher East from Lisclogher. Various third-class roads provided access to the Application Site in 1988 as well as public rights of way into Lisclogher and Ballivor. Historical mapping from the 1940s indicates that these roads were already present. Aerial mapping from 1988 indicates that one off housing and farms were located along the roads that served the Application Site.

Two level crossings were present at the Application Site in 1988; one at the Ballivor-Raharney (R156) road to facilitate train crossing from Ballivor Bog to Carranstown Bog and vice versa, and one to facilitate crossing from Bracklin Bog to Lisclogher Bog across a local road.

Standard level crossing lamps with light sensors that switched to light on when daylight faded were fitted across all the Applicant's Móna crossing gates. Catch points were also fitted into railway tracks on either side of level crossing gates as a standard safety practice to de-rail any runaway trans before reaching the level crossing.

The road network and Application Site entrance points present in 1988 remained in place throughout the decades and are still in use today.

5.3.7 Amenities and Community Facilities

Amenities and community facilities located in the surrounding areas present in 1988 included the local GAA clubs, namely Ballivor GAA club and the Royal Canal Walk which runs along the Royal Canal 3.3km south of the Application Site.

5.3.8 Human Health

There is no human health data for 1988 available for the Study Area, Counties or State. The Census 2011 introduced questions on general health, therefore there is no health data available for Census years previous [7]. As such the 2011 Census health data has been used to infer the 1988 baseline. Census 2011 Human Health results for the State and Counties are presented in Table 5-14 below. In general, the percentage health breakdown for the State and County populations are very similar. The State and Counties all reported in the range of 90% for a combined 'very good' and 'good' health.

Table 5-4 Human Health Data from Census 2011

	Very Good	Good	Fair	Bad	Very Bad	Not Stated
State	2,767,681	1,282,956	368,131	57,243	12,418	99,823
County Meath	117,657	49,209	11,817	1,693	371	3,388
County Westmeath	51,061	24,842	7,150	1,132	267	1,712

5.3.8.1 Air Quality

5.3.8.1.1 *Dust*

There are no data pertaining to dust monitoring at the site or surrounding area for the period 1988. Monitoring for dust deposition has been undertaken on the Application Site as a requirement of the IPC Licence (Reg. P0501-01) for the Application Site since 2000. The monitoring results are reported in the Annual Environmental Report (AER) each year, which are included as Appendix 4-3 of this rEIAR. Monitoring typically takes place between April to September of each year to correspond to the peat harvesting season. Monitoring is conducted at 1 no. location on the Application Site: DM-03 Ballivor. Monitoring results for location DM-03 are available in the AERs for 2001, 2002 and 2008 – 2020.

Dust emissions are dramatically reduced where rainfall has occurred due to the cohesion created between dust particles and water and the removal of suspended dust from the air. High levels of moisture either retained in soil or as a result of rainfall help suppress the generation of dust due to the cohesive nature of water between dust particles. Rain also assists in removing dust from the atmosphere through washout. It is typical to assume no dust is generated under 'wet day' conditions where rainfall greater than 0.2mm has fallen (USEPA, 2006). A review of data for Mullingar metrological station which is located approximately 16km southwest of the Application Site states that there were 209 days (57% of the year) with greater than 0.2mm rainfall annually over a 30-year averaging period (1979 – 2008) (Met Eireann, 2024). Therefore, the majority of the time dust emissions were reduced naturally due to meteorological conditions. Please see Chapter 9 Air Quality for further details.

5.3.8.1.2 *NO_2, PM_{10} and $PM_{2.5}$*

Long-term air monitoring data has been reviewed and used to determine background concentrations for the key pollutants of NO_2, PM_{10} and $PM_{2.5}$ in the region of the Application Site. There are no data pertaining to air quality and emissions at the Application Site or surrounding area for the period 1988, with specific pollutant concentrations only being available from 2006 onwards However it can generally

[7] *Census 2011 Profile 8 Our Bill of Health page 26*
https://www.cso.ie/en/media/csoie/census/documents/census2011profile8/Profile_8_Full_document.pdf p26

be assumed that historical air quality dating back to 1988 was of a lesser quality than in more recent years. Please see Chapter 9 Air Quality for further details.

5.3.8.1.3 *CO_2 Emissions*

It is estimated that a total of 69,311 tonnes of CO_2 emissions arose from the Application Site in the year 1988. Please see Appendix 10-1 Carbon Calculations for more details on how this figure was derived.

5.3.8.2 Noise

In 1988, different types of machinery were in use on the Application Site during different seasons of the year, for the purposes of peat extraction activities and all ancillary works and are listed in Chapter 4 Description. Additionally, vehicular movements to and from the Application Site made use of existing roads to reach various end users. Potential noise impacts from plant and equipment would have been experienced intermittently at any given sensitive receptor location during the active periods due to the continuous movement of machinery around the bogs, i.e., no machinery operated continuously in the one location near sensitive receptors.

5.3.8.3 Health & Safety

As one of the country's largest and longest established industrial employers, the Applicant has long standing health and safety protocols in place across all their sites. Below is a list of training that was in place across all Bord na Móna landholdings including the Application Site since the 1940s and were part of the day-to-day training and operations during the year 1988.

- Fire safety;
- First Aid;
- Operation and maintenance of plant & machinery;
- Use of hand & power tools;
- Site Safety;
- Road Safety;
- Safe Workshop Operation Procedures;
- Transport Operation Procedures;
- Hazard Identification, Risk Assessment; and,
- Working at Heights.

5.3.8.4 Vulnerability of the Project to Major Accidents and Natural Disasters

There are no reports of natural disasters at the Application Site in the year 1988 (or indeed prior to this period). Measures to prevent and contain such events that were in place in 1988 are discussed below. These measures formed part of day-to-day bog operations and management.

Ireland is located in a geologically stable country with a mild temperate climate. Therefore, historically there has been limited potential for natural disasters to occur within the Application Site. The potential natural disasters that may occur on a site such as the Application Site may include bog fire, flooding and landslides.

For full details on the vulnerability of the Application Site to major accidents and natural disasters, please see Chapter 15 of this rEIAR.

5.3.8.4.1 *Bog Fires*

There are generally two potential sources of fire at a bog, internal and external:

Internal Sources:

- Heating peat;
- Machinery;
- Cigarettes and matches; and,
- Hot work production areas and rail lines.

External Sources:

- Burning of gorse / heather / brush;
- Cigarettes and matches; and,
- Trespass of motorbikes.

Formal fire safety procedure documentation is not available for 1988. However personal communication with former personnel indicate that the below bulleted measures were in place at the Application Site in 1988:

- All employees maintained vigilance on bog areas at all times, but particularly during production season and during high fire risk periods.
- Fire prevention and awareness training was provided to all employees as part of induction training. Refresher training provided periodically. Specific fire training provided to all relevant employees.
- Machines were inspected and washed / blown down on a daily basis.
- Peat Piles prone to heating were closely monitored.
- Smoking was restricted to designated areas and was prohibited in machines and on bog areas.
- In order to minimise the risk of fire, peat sales plans took account of piles prone to heating.
- Areas were left safe from the threat of fire following hot work carried out on bog or on rail lines.
- Fire watch was carried out (minimum period of one hour) by members of production team at the end of each production day.
- Fire patrols were organised by local management / operations leaders during periods of high fire risk.
- Production operations were suspended as necessary during periods of high fire risk.

Records of Fires at the Application Site

There is no known record of bog fires at the Application Site in 1988.

5.3.8.4.2 *Flooding*

The Applicant has no records of flooding at the Application Site in 1988 or otherwise. Furthermore, there are no recurring flood incidents or instances of historical flooding identified within the Application Site on historic OS maps or in OPW flood maps. Identifiable map text on local available historical 6" or 25" mapping for the site does not list any areas within the Application Site as "*liable to flood*".

The risk of flooding is addressed further in Chapter 8: Hydrology and Hydrogeology and Appendix 8-1 Flood Risk Assessment.

5.3.8.4.3 *Peat Landslide*

Geological Survey Ireland (GSI) does not have any records of historic landslides within the Application Site or in the surrounding lands in 1988. The closest recorded landslide event (1999) is mapped at

Girley Bog, Chamberlainstown, approximately 12km northeast of Lisclogher Bog. Girley Bog is classed as a raised intact bog. "No apparent Impact" is recorded for this event.

Please see Chapter 7 Land Soil and Geology for details.

5.4 Population Data

Population data for the Study Area, Counties Meath and Westmeath and the State for the years 1986 to 2022 have been presented in this section. Census data has been collated and analysed for the following years:

- Census 1986
- Census 1991
- Census 1996
- Census 2002
- Census 2006
- Census 2011
- Census 2016
- Census 2022

These particular years have been selected to inform the Peat Extraction Phase (July 1988 - June 2020) and Current Phase (June 2020 - Present) to decipher the effects that the Project has on population in the Study Area. It is not possible to assess the Remedial Phase in terms of population as there is no prospective population data available.

Figure 5-1 below shows population change in the Study Area from years 1986 to 2022. Steady growth is observed, with the population increasing over time. Similar trends are observed for county levels, illustrated in Figure 5-2 and national levels, illustrated in Figure 5-3 below. A more detailed overview of national, county and Study Area population figures is detailed in Table 5-5 below.

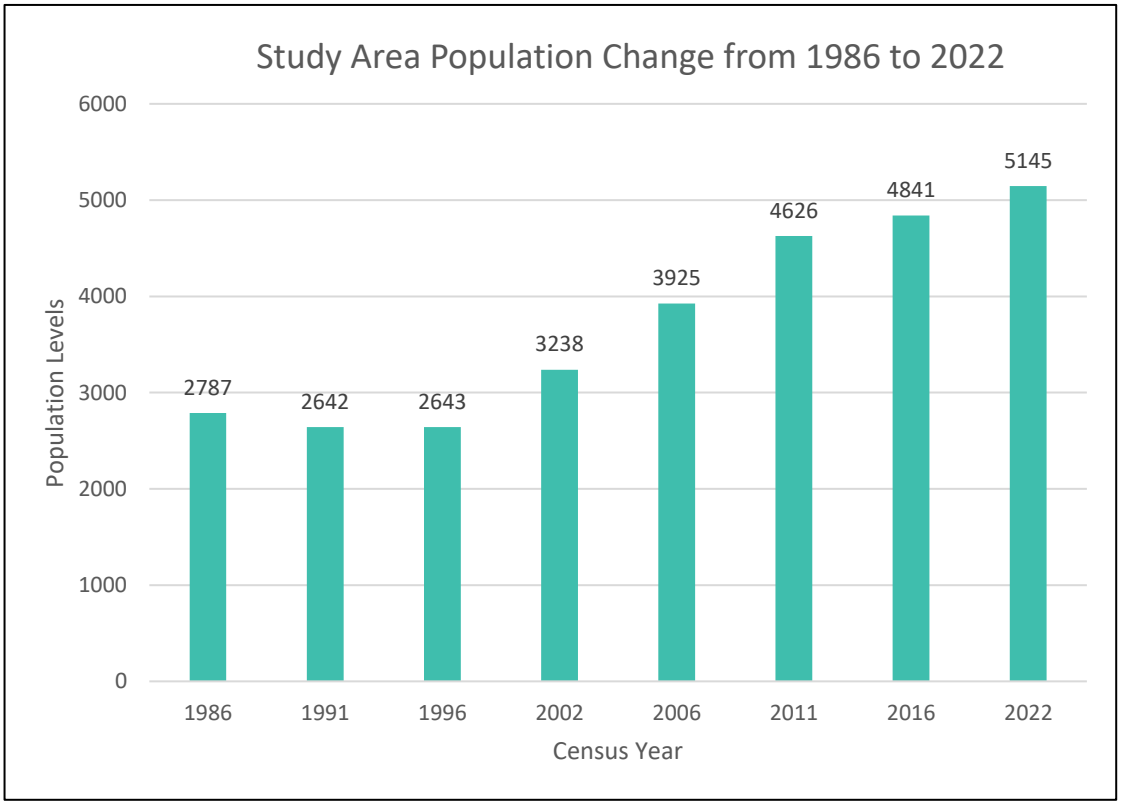

Figure 5-1 Study Area Population Change from 1986-2022. Source https://data.cso.ie/

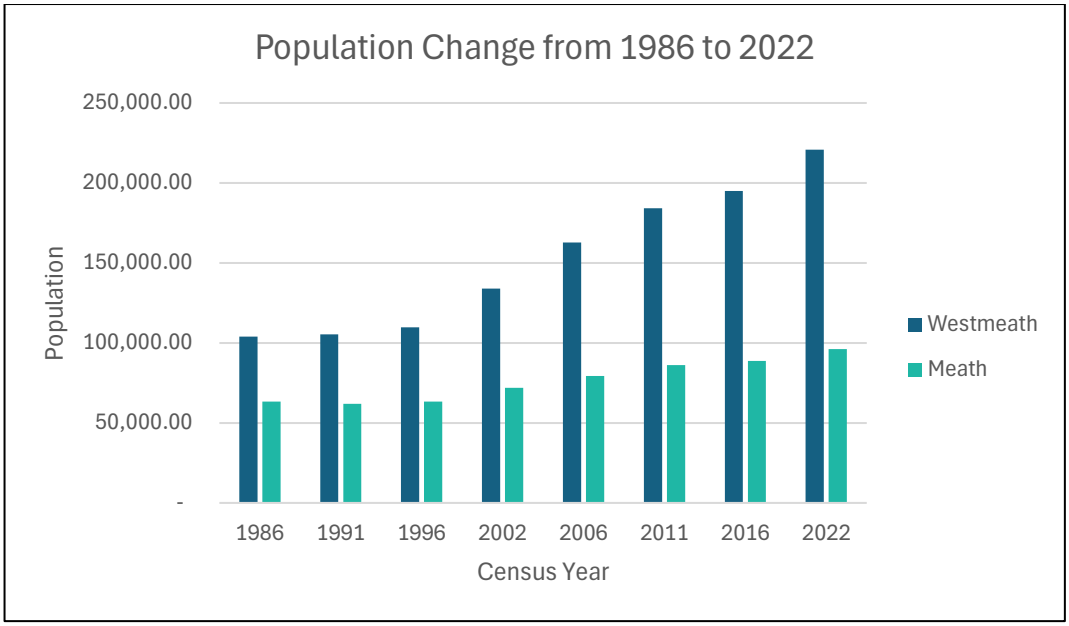

Figure 5-2 County Population Change from 1986-2022. Source https://data.cso.ie/

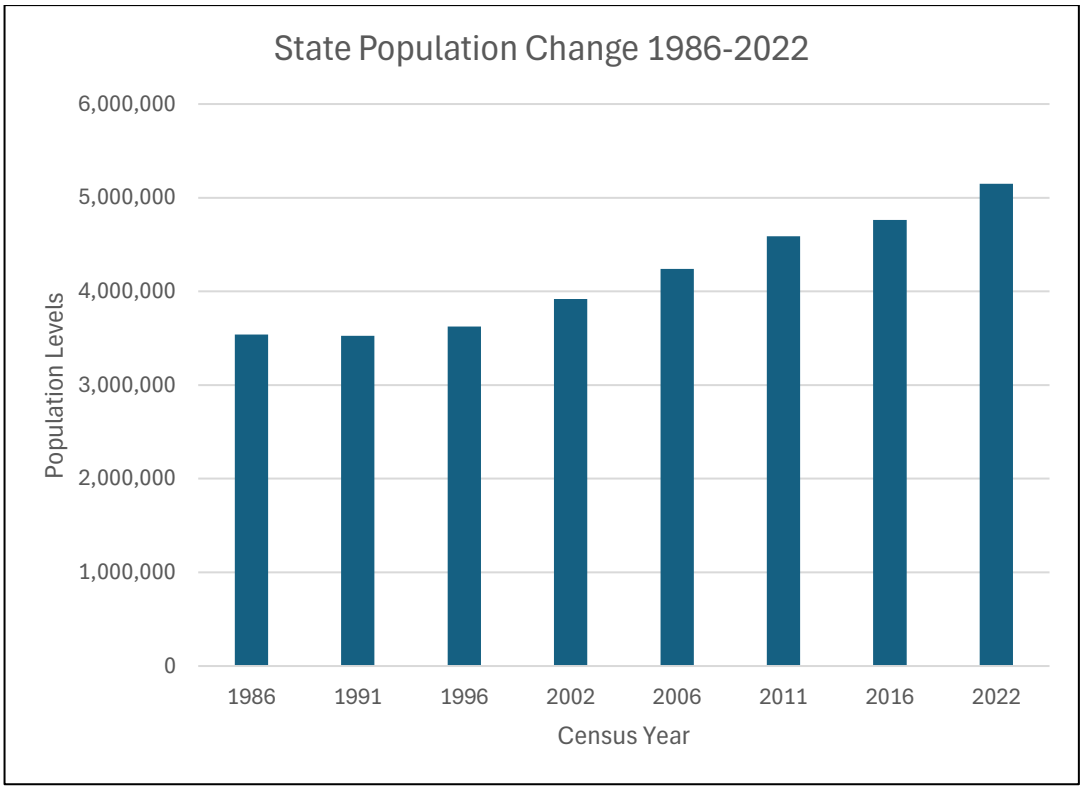

Figure 5-3 State Population level changes from 1986-2022. Source https://data.cso.ie/

Table 5-5 Study Area Population levels 2006-2022

Area	Population Levels							
	1986	1991	1996	2002	2006	2011	2016	2022
State	3,540, 643	3,525,719	3,626,087	3,917,203	4,239,848	4,588,252	4,761,865	5,149,139
County Meath	103,881	105,370	109,732	134,005	162,831	184,135	195,044	220,826
County Westmeath	63,379	61,880	63,314	71,858	79,346	86,164	88,770	96,221
Study Area	2,787	2,642	2,567	3,238	3,925	4,626	4,841	5,145

5.4.1 Employment and Economic Activity

Employment figures for the census years 1986, 1991, 1996, 2002, 2006, 2011, 2016 and 2022 for Counties Meath and Westmeath are illustrated in Figure 5-4 below while national employment figures are illustrated in Figure 5-5. A slight dip in national and county employment figures are presented in Figures 5-4 and 5-5 which correspond to the 2008 global economic recession which resulted in a decrease in employment in 2011. Despite this, the 2016 Census results for both county and national levels see an increase in employment figures with this trend continuing for the 2022 Census also.

Study Area employment figures are available on the CSO website for the years 2002, 2011, 2016, and 2022 and totalled 1,323, 1,650, 1,844 and 2,340 respectively. These employment figures indicate a general increase over the years and follow the employment trends at County and State level for the same period. The increase in employment figures also correlate with the growing population level.

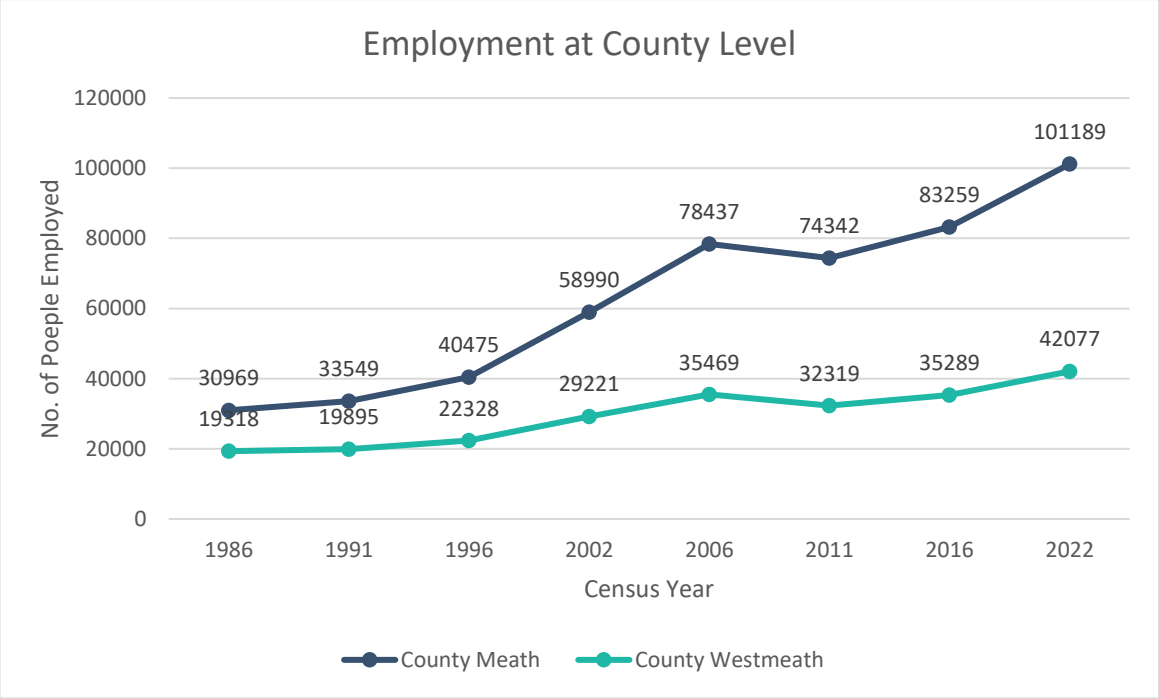

Figure 5-4 Employment at County Level for Census 1986- 2022

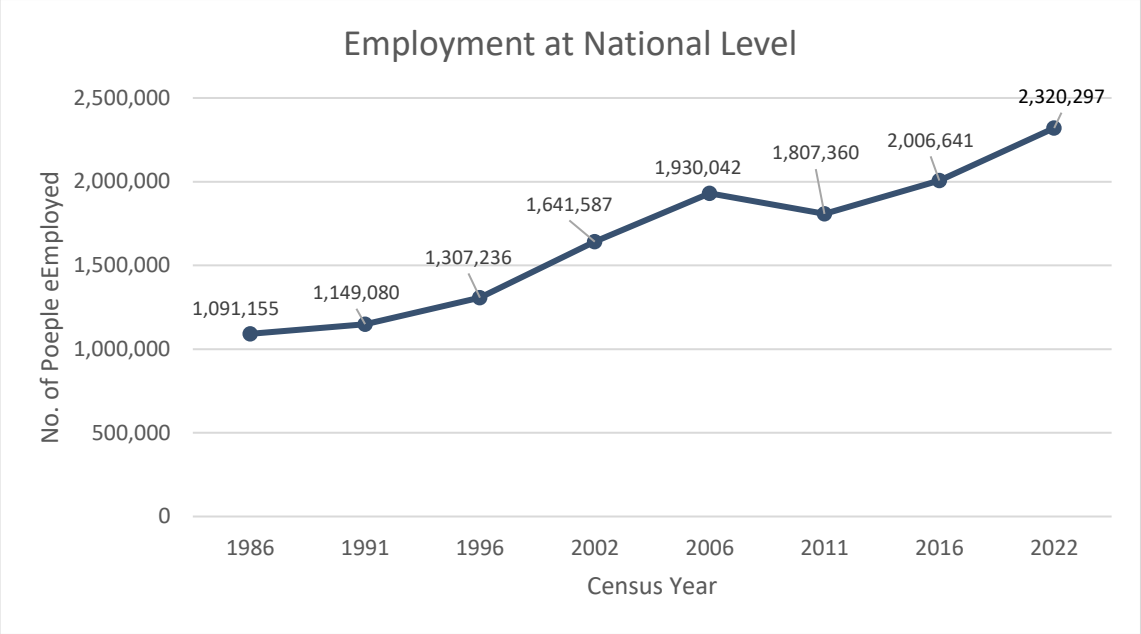

Figure 5-5 Employment at National Level for Census 1986- 2022

5.4.1.1 Bord na Móna Employment

According to the "Energy Crop Socio-Economic Study" by Fitzpatrick Associates in 2011, there were an estimated 1,443 jobs supported by the peat-to-power industry in Ireland. These constituted jobs in the plants and in peat extraction, jobs indirectly supported in upstream supply industries and jobs induced through the trickle-down effects of the wages and salaries of those supported directly or indirectly. In October 2017, there were 2,012 workers employed by Bord na Móna in Ireland across all departments, with a further 88 employed in the UK. It is estimated that the 2,012 jobs provided by the Applicant equated to 1,865 full time equivalents. Of these 2,012 jobs, 1,734 jobs were directly or indirectly located in the Midland region including Westmeath.

The Census for years 1986, 1991, 1996, 2002, 2006, 2011, 2016 and 2022 has classified employment figures by Industrial Groups, with the 'Mining, Quarrying and Turf Production' industrial group being relevant to Bord na Móna employment. National and county figures under this industrial group are presented in Table 5-6 below. Figures for the Study Area for every of the above years under this industry category are not available on the CSO website, therefore national and county figures have been assessed to establish general trends. The figures indicate an overall decline in figures in the mining, quarrying and peat production industry group, which can be largely attributed to the ceasing of peat production in 2020.

In 2011, County Meath record the highest number of people employed in the Mining, quarrying and turf production industry [8]. The 2011 Census Results have further categorised this industry for national levels, with 1,512 people being employed in the 'extraction and agglomeration of peat'. This accounts for 27% of the total people employed in the mining, quarrying and turf production group.

[8] https://www.cso.ie/en/media/csoie/census/documents/census2011profile3/Profile_3full_doc_for_web_sig_amended.pdf

Table 5-6 Census Figures for State, County Meath and Westmeath in Mining, Quarrying and Turf Production Group for 1986-2022

	1986	1991	1996	2002	2006	2011	2016	2022
State	8,367	6,015	5,774	6,658	7,751	5,674	5,055	4,756
County Meath	1,034	839	795	726	905	741	704	707
County Westmeath	454	219	236	201	238	153	130	149

5.4.1.2 Employment at the Application Site

At the Application Site, the majority of peat extracted was supplied to the horticultural industry. According to the Irish Farmer's Association 'Labour Review of Horticulture in Ireland (2016)' and the 'Key Issues Consultation Paper in Relation to a Review of the use of Peat in the Horticultural Industry (2020)', the Irish commercial horticultural industry was valued at €437 million in 2018 with an estimated 6,600 employed full time in primary production activity and a further 11,000 employed in value added and downstream businesses (not including the wholesale trade) resulting in an employment value of €497m.

In recent years, the Applicant employed on average 20 No. staff full time in peat extraction activities and all ancillary works at the Application Site as well as 5 seasonal employees per annum from 2013 to June 2020. Since peat extraction ceased, the Applicant employed 2 No. permanent staff and 4 No. seasonal staff for the removal of stockpiled peat off the bogs for transportation to Kilberry, Edenderry Power Station and Derrinlough Briquette factory. By the end of 2023, all stockpiles were removed off the bogs.

Currently, 5 no. staff are also employed in environmental monitoring and maintenance is also ongoing at the Application Site across the Derrygreenagh Bog Group, in which the Application Site is located. Condition 11 of the IPC Licence pertains to required ongoing sampling, analyses, measurements, examinations, maintenance and calibrations as set out in Schedule 1 and 3 of the licence. Please see Appendix 4-1 IPC Licence for details.

5.4.2 Services

The nearest village to the Application Site is Ballivor which is located 2.2km to the east in County Meath. The village provides a range of services such as educational, recreational, religious, and retail. Further services are also found in the villages of Delvin and Raharney, 2.5km northwest and 3.7km west of the Application Site, respectively.

5.4.3 Education

The nearest school to the Application Site is Coolronan National School, located approximately 1.3km southeast of the Application Site. Scoil Columbain is located 2.2km east of the Application Site. Columba College in Killucan is the nearest Secondary school located approximately 5km southwest of the Application Site.

5.4.4 Access and Transport

The Application Site is accessed via the R156 Regional Road which traverses the centre of the Application Site. At present, the 115C bus travels between Ballivor and Raharney along the R156

through the centre of the Application Site several times a day. The 115C continues to Mullingar from where connections to Athlone, Tullamore, Kells, Portlaoise and Dublin can be made.

5.4.5 Bord na Móna Housing

The Applicant has a long history of providing housing for its employees, which began with the provision of hostel accommodation for migrant male workers who were housed during the 'Emergency Years' to produce fuel supplies from the Allen Bogs. These hostels housed over 100 men in some locations. As well as accommodation and meals, the hostels provided 'wet' and 'dry' canteens, film showings and recreation halls. This was followed by the Cottage Schemes in 1950, when seasonal work was replaced by more permanent opportunities.

The Turf Development Act 1950 contained provisions for the expansion of the Applicant's activity to bring production capacity up to two million tonnes of machine sod turf per annum across all Bord na Móna bogs and plans for four additional power stations. In addition, under Section 5(1), it gave the Applicant the authority to construct housing for the permanent workforce. Nine schemes comprising a total of 582 houses were submitted to the Minister of Industry and Commerce for approval and site development works commenced in 1951. This included over 100 houses in Co. Westmeath and housing in Co. Meath. The first housing schemes were designed by Frank Gibney and were built at Clonast, Mount Dillon, Littletown, Timahoe South and North, Boora and Derrygreenagh.

A total of 9. No houses were built by the Applicant for employees in Ballivor Village in 1956. Within 30km of the Application Site, the Applicant built a further 100 No. houses at the Derrygreenagh Park Estate in Rochfortbridge, Co. Westmeath, as well as 7 No. one-off houses in the County and 1 No. one-off house in Co. Meath. All these houses have since been transferred into private ownership.

5.4.6 Amenities and Community Facilities

Most of the amenities and community facilities, including GAA and other sports clubs, youth clubs and recreational areas available in the area are in the nearby settlements of Ballivor, Raharney and Delvin as well as Killucan 6 km to the west. Other amenities in the area include the National Exotic Animal Sanctuary, Clay Target Shooting, Coolronan Raceway Club and the Royal County Model Flying Club.

The nearest marked walkway is the Royal Canal Walk which runs along the Royal Canal 3.3km south of the Application Site.

5.5 Human Health

Tables 5-7 and 5-8 below details the general health of persons by percentage for the State, County Meath and County Westmeath and the Study Area for 2011, 2016 and 2022. The Census 2011 introduced questions on general health, therefore there is no health data available for Census years previous.

In general, the percentage health breakdown for the State, Counties and Study Area populations are very similar. The study area State and Counties all reported in the range of 90% for a combined 'very good' and 'good' health. The majority of electoral divisions in the Study Area reported a lower percentage than the State and Counties for those who have a 'bad' and 'very bad' health. Therefore, it can be concluded that those living in the Study Area consider their health to be in a better condition that the State and County average.

Table 5-7 Percentage General Health Breakdown for the State and Counties Meath and Westmeath as reported in the 2022 ,2016 and 2011 Census. Source www. CSO.ie

	Very Good			Good			Fair			Bad			Very Bad			Not Stated		
	2022	2016	2011	2022	2016	2011	2022	2016	2011	2022	2016	2011	2022	2016	2011	2022	2016	2011
State	53.23%	59.4%	60.3%	29.66%	27.6%	28%	8.64%	8%	8%	1.41%	1.3%	1.2%	0.33%	0.3%	0.3%	6.74%	3.3%	2.2%
Westmeath	52.1%	58%	59.2%	30.24%	28.7%	28.8%	8.81%	8.2%	8.2%	1.38%	1.3%	1.3%	0.29%	0.3%	0.3%	7.19%	2.9%	2%
Meath	57.1%	63%	63.8%	29.61%	26.48%	26.7%	7.56%	6.68%	6.4%	1.17%	1.3%	1%	0.27%	0.2%	0.2%	4.29%	2.4%	1.8%

Table 5-8 Percentage General Health Breakdown for the study area as reported in the 2022, 2016 and 2011 Census. Source www. CSO.ie

Study Area- Electoral Divisions	Very Good			Good			Fair			Bad			Very Bad			Not Stated		
	2022	2016	2011	2022	2016	2011	2022	2016	2011	2022	2016	2011	2022	2016	2011	2022	2016	2011
Bracklin, Westmeath	56%	60%	59.2%	33.1%	30%	28.9%	7.27%	8.5%	6.8%	0	0.7%	1.1%	0	0	0	3.64%	0.4%	1.1%
Ballyhealy, Westmeath	53.98%	58%	65.7%	28.02%	31.3%	23%	7.67%	9%	6.4%	1.77%	0.7%	2.5%	0	0	0.4%	8.55%	1%	1.4%
Copperalley, Westmeath	58.27%	56%	63%	25.94%	33.8%	26.7%	8.65%	6.5%	7%	0.75%	1.4%	1.8%	0.38%	0.4%	0	6.02%	1.1%	1.1%
Cloghbrack, Meath	55.25%	61.3%	59.6%	33.51%	28.28%	29.3%	6.52%	6.9%	7.6%	0.75%	2%	1.4%	0.54%	0	0.4%	3.44%	1.4%	1.8%
Killaconnigan, Meath	57.16%	65%	66.4%	29.56%	24%	26.4%	8.27%	6.7%	5%	1.70%	1.07%	0.8%	0.39%	0.13%	0.3%	2.92%	3%	0.9%

Killyon, Meath	55.46%	63%	62%	31.43%	27.8%	24.7%	5.55%	6.8%	7.7%	1.18%	1%	1.2%	0.50%	0.4%	0	5.88%	1%	5%
Riverdale, Meath	56.70%	67%	63.8%	30.29%	26%	25.1%	8.74%	5.4%	9.3%	1.55%	0.9%	1.17%	0	0.2%	0.2%	2.72%	0.4%	0.4%
Ballynaskeagh Westmeath	57.52%	67.3%	65.3%	31.70%	22.3%	24.25%	8.17%	7%	8.2%	1.31%	1.7%	1.5%	0.33%	0	0	0.98%	1.4%	0.75%

5.5.1 Air Quality

5.5.1.1 Dust

Monitoring for dust deposition has been undertaken on the Application Site in the past as a requirement of the IPC Licence for the Application Site. Monitoring results for 2001-2023 are reported in their respective Annual Environmental Report (AER), which are included as Appendix 4-3 of this rEIAR. Monitoring results for location DM-03 Ballivor are available in the AERs for 2001, 2002 and 2008 – 2020. No dust monitoring was carried out at the Application Site in 2021 and 2022 due to the cessation of the peat extraction in June 2020.

There were no results detailed in the AER for 2007, however, it was noted that there was an exceedance of the limit value at this location due to an excavator operating directly adjacent to the dust gauge thereby causing a localised non-compliance event. There have not been any exceedances of the limit value of 350 mg/m^2/day over the period 2008 – 2020. Please see Chapter 9 Air Quality and Appendix 4-3 Annual Environmental Reports (AER) for further detail.

5.5.1.2 NO_2, PM_{10}, $PM_{2.5}$

Long-term NO_2 monitoring has been carried out at the rural Zone D locations of Kilkitt Co. Monaghan and Emo, Co. Laois with data available for the period 2006 – 2022. Data from 2006 – 2022 has been reviewed in the absence of older historic data. Long-term PM10 monitoring has been carried out at the rural Zone D location of Kilkitt Co. Monaghan with data available for the period 2006 – 2022. Monitoring of PM2.5 is undertaken at the rural Zone D location of Claremorris Co. Mayo.

The EPA state that air quality is improving over time (EPA, 2023) as a result of the introduction of various policies and measures particularly in relation to road transport emissions and the use of cleaner fuels and the gradual introduction of hybrid and electric vehicles.

Please see Chapter 9 Air Quality for further details on trends in Air Quality for NO_2, PM_{10}, $PM_{2.5}$.

5.5.1.3 CO_2 Emissions

Trends in Greenhouse Gas emissions at a national level are available in annual reports by the EPA. The most recent EPA report entitled 'Ireland's Provisional Greenhouse Gas Emissions 1990 – 2022' (EPA, 2023) reviews national emissions in 2022 and trends in emissions from 1990.

The CO2 emissions associated with the peat extraction activities and all ancillary works over the period 1988 – 2020 were calculated. On average over this 33-year period there was 81,911 tonnes of CO2 per annum released from the Application Site. It is estimated that a total of 2,703,053 tonnes of CO_2 emissions arose from the Application Site in the year during the period of 1988 to 2020. Annually this equates to 0.03% of Ireland's 2021 – 2025 carbon budget of 295 MtCO2e or 0.05% of Ireland's more stringent 2030 – 2035 carbon budget of 151 MtCO2e. Please see Chapter 10 Climate and Appendix 10-1 Carbon Calculations for more details.

5.5.2 Water Quality

There is 1 no. mapped Public Water Supply Scheme (PWS) within 3 km of the Application Site. The Source Protection Area (SPA) for the Ballivor PWS is located to the east of Carranstown and Bracklin bogs, approximately 1.5 km north of Ballivor village. This SPA is more than 2km from the boundary of the Ballivor Bog Group. A search of private well locations (wells with location accuracy of 1–100m were only sought) was undertaken using the GSI well database (www.gsi.ie). One well (GSI Name: 2625SWW072) was identified in the east of Ballivor Bog in the townland of Clonycavan. This well reports a poor yield class of 8.7m3/day. Several additional wells with a location accuracy of 1km are

mapped in the vicinity of the Ballivor Bog Group. These wells all have a poor yield class. As these wells are mapped only to an accuracy of 1km and therefore assessing potential impacts on these wells cannot be undertaken in any reliable manner.

The GSI also map several additional private boreholes and wells in the vicinity of the Application Site. These private water supplies are reliant on groundwater flows in the deeper bedrock aquifer underlying the glacial deposits.

Deep groundwater recharge from the Application Site to the underlying bedrock aquifers will have been minimal. The restriction of recharge relates to the generally impermeable layers which underlie much of Irelands' bogs leading to a 4% recharge coefficient for the bogs. Therefore, the majority of the groundwater drainage and seepage in the bogs would have a lateral flow direction, discharging into the perimeter drains and entering the surface water drainage network in the lands surrounding the bogs.

Please see Chapter 8 Hydrology and Hydrogeology for further details.

5.5.3 Noise

From 2000 onwards, the Application Site has operated under IPC Licence P0501-01. Conditions 8 and 3 of the IPC Licence includes limits on noise levels at the Application Site. The relevant noise level limit is 55dB LAeq, 30min at noise-sensitive locations. This noise criterion is applied to the Peat Extraction Phase, the Current Phase and Remedial Phase; this is considered appropriate as the activities in each phase formed or will form part of the normal scheduled activities at the Application Site for that period. For further detail on Noise, please refer to Chapter 11 Noise and Vibration.

5.5.4 Health & Safety

The Applicant has long been a cognisant of Health and Safety. Following a number of explosions in Lullymore Briquette Factory in the late 1940s and early 1950s[9], the comprehensive scheme for accident prevention was devised[10]. In 1958, a permanent committee was established within Bord na Móna to administer accident prevention schemes. Each Works site had a first aid team consisting of trained volunteers who partook in regular training and administered first aid as required during operations. In 1981, a new safety policy was adopted across the company.

Since 2000, the Application Site has been operating under IPC Licence P0501-01. Condition 13 of the IPC Licence states that it is the responsibility of the license holder (the Applicant) to ensure that a documented Emergency Response Procedure is in place which shall address any emergency situation which may originate on-site. This Procedure includes provision for minimising the effects of any emergency on the environment. As part of the Applicant's obligation to submit annual environmental reports, the Applicant must include the time, location, description and frequency of incidents such as explosions, contaminations, fires, uncontrolled releases and complaints to the EPA and all incidents must be investigated.

The Applicant recognises the proper management of safety, health and welfare as a core business value. It acknowledges its obligations, both legal & moral, as an employer to manage and protect the safety, health and welfare of its employees and others who may be affected by its activities, and in doing so, commits to achieving and maintaining the highest standards of Health & Safety reasonably practicable. Please see Appendix 5-2 for a copy of the Applicant's Safety Statement which sets out arrangements to secure & manage safety, health and welfare at places of work within the Applicant's peat operations. The through implanting the Safety Statement, the Applicant comply, as a minimum, with all statutory requirements, common law duties, codes of practice and best industry practice relating

[9] *Donal Clarke (2010) Brown Gold: A History of Bord na Móna and the Irish Peat Industry, pp. 84*
[10] *Donal Clarke (2010) Brown Gold: A History of Bord na Móna and the Irish Peat Industry, pp. 102*

to peat operations activities, including the Safety Health & Welfare at Work Act 2005, the SHWW (General Application) Regulations 2007, as amended, and the SHWW Construction Regulations, 2013.

All peat operating employees receive training and instruction to ensure that they fully understand the hazards of their work area, the control measures put in place to minimise the risks and the emergency procedures at the facility. Training is coordinated by an in-house training specialist in conjunction with management and health & safety personnel. The services of competent persons / organisations are employed, where necessary, to carry out all other required training. Training is repeated periodically as appropriate. Training provided to all peat operating staff includes:

- Fire safety
- First Aid,
- Operation of plant & machinery
- Manual Handling
- Chemical Safety
- Machine Guarding
- V.D.U. Safety
- Use of hand & power tools
- Site Safety
- Road Safety
- Use of Equipment
- Safe Workshop Operation Procedures.
- Transport Operation Procedures
- Hazard Identification, Risk Assessment
- Work at Height
- Legislation
- Confined Space Entry
- Office safety

Additional training is provided in the following circumstances as necessary; -

- A change in work practices.
- The introduction of new systems of work.
- A change in equipment / machinery.
- The introduction of new technology.

5.5.5 Vulnerability of the Project to Major Accidents and Natural Disasters

As detailed in Section 5.3.8.4 above, Ireland is located in a geologically stable country with a mild temperate climate. Therefore, historically there has been limited potential for natural disasters to occur within the Application Site. The potential natural disasters that may occur on a site such as the Application Site may include bog fire, flooding and landslides.

For full details on the vulnerability of the Application Site to major accidents and natural disasters, please see Chapter 15 of this rEIAR.

5.5.5.1 Bog Fires

The Applicant's focus when it comes to the prevention and management of bog fires is:

- Protection and safety of employees and members of the public;
- Protection of external property;
- Protection of the Applicant's property; and,
- Protection of habitats and biodiversity.

At present, fire safety and awareness training is provided as part of the Applicant's general safety induction with reoccurring refresher training every three years. Please see Appendix 5-1 Fire Prevention & Fire Fighting Procedures for Peat Production Bogs for further details regarding present fire safety measures.

To ensure no instances of internal fire sources, all Bord na Móna staff:

- Receive fire training and refresher training provided periodically. The Applicant's fire safety training include:
  - Fire Safety Training includes the following:
  - General Fire safety awareness and fire detection / prevention.
  - Use of fire extinguishers.
  - Use of machinery in firefighting.
  - Use of pumps, floatation pumps and fire rollers.
  - Fire prevention for machinery, including washing and blowing down.
  - Use and maintenance of PPE used in firefighting.
  - Dealing with small fires.
  - General Health and Safety, including Hazard Identification and Risk Assessment.
- Follow the procedures to minimise fire hazards on machinery as outlined in the Bord na Móna Fire Prevention & Fire Fighting Procedures for Peat Production Bogs.

Bord na Móna Resource Managers designate control persons for firefighting. Their responsibilities include:

- Management of persons (including members of the public) entering and leaving sites under control.
- Co-ordination of persons on sites under their control.
- Liaison with Fire and other emergency services as necessary.
- Organisation of welfare facilities.
- Establish and maintain frequent contact with relevant external organisations and local fire services.
- Each Bog Area operation leader / team leader / supervisor must ensure the following:
  - Firefighting machinery is available and ready for use if required.
  - Minimum of one fire roller unit (Tractor with attached roller) is available and ready for use in each area.
  - Lights are working on all machines.
  - Flashing beacons are ready and are placed on all relevant machines during firefighting activities.
  - All machines have appropriate numbers of fire extinguishers.
  - Fire extinguishers checked daily, and a reserve number are kept.
  - All tractors have fire buckets and shovels, and all dozers have afire bucket.
  - Water sources on or adjacent to bog are appropriate, maintained, and available for use during firefighting.
  - Fire signs are in place and maintained.
  - Maps and aerial photographs provided to areas are in place and maintained.
  - Emergency contact numbers for each area in place

Records of Fires at the Application Site

A bog fire occurred at Lisclogher West and Lisclogher bogs in 2008. This fire occurred due to dry weather conditions. In both cases, the EPA was contacted, and corrective measures were put in place and the fires were brought under control. No Bord na Móna staff or third parties were involved in the outbreak of the fire and the fires were contained by Bord na Móna staff within the Application Site boundary. The 2008 dust monitoring results collected from the dust monitor located at Ballivor Bog entrance or that year were within the emission limit of 350mg/m^2/day. There are no other records of

fires at the Application Site. Since 2000, it has been a condition of the IPC Licence that fires are reported to the EPA in the Annual Environmental Reports.

5.5.5.2 Flooding

The Applicant have no records of flooding at the Application Site from 1988 onwards. Furthermore, there are no recurring flood incidents or instances of historical flooding identified within the site on historic OS maps or in OPW flood maps. The Application Site lies outside of the OPW's present day indicative river and coastal flood zones. In addition, the GSI Groundwater Flood mapping does not record any groundwater flood zones with the Application Site.

The Local Authority Strategic Flood Risk Assessment (SFRA) mapping indicates that areas in the northwest of Lisclogher Bog are vulnerable to fluvial flooding. However, site walkovers have revealed that the EPA incorrectly mapped a river to cross Lisclogher Bog casting doubt on the validity of the flood zones in this area.

CFRAM mapping includes modelled flood levels for the 10-year and 100-year flood events. These levels, modelled near Ballivor village, range from 64.19 – 65.34m OD and are well above the current outfall pipe elevations at the Application Site. Therefore, the risk of fluvial flooding along the Ballivor River, located to the east of the Application Site, backing up into the site drainage network is very low.

The main risk of flooding across much of the Application Site is via pluvial flooding due to the low permeability peat soils and subsoils. The surface of the cutover bog contains an extensive network of peat drains with surface water outflows from the bogs. This existing drainage network has reduced the risk of pluvial flooding across much of the Application Site. However, following periods of intense and prolonged rainfall events localised surface water ponding still could occur in places. Flood modelling of Ballivor, Bracklin West, and Carranstown bogs have been completed by the Applicant (2020). That study indicates there is significant storage within each of the bog basins to alleviate any flood risk associated with pluvial flooding. The risk of flooding is addressed further in Chapter 8: Hydrology and Hydrogeology and Appendix 8-1 Flood Risk Assessment.

5.5.5.3 Peat Landslide

Geological Survey Ireland (GSI) does not have any records of historic landslides within the Application Site or in the surrounding lands from 1988 to present day. The closest recorded landslide event (1999) is mapped at Girley Bog, Chamberlainstown, approximately 12km northeast of Lisclogher Bog. Girley Bog is classed as a raised intact bog. "No apparent Impact" is recorded for this event.

A peat stability assessment was carried out for the Application Site as part of the proposed Ballivor Wind Farm (Ref. PA25M.316212) application which has been appended as part of this rEIAR as Appendix 7-1 Peat Stability Assessment. Please see Chapter 7 Land Soil and Geology for further details.

5.6 Likely Significant Effects and Associated Mitigation Measures

5.6.1 Do-Nothing Option

As outlined in the EPA Guidelines (May 2022), the description of 'Do-Nothing Effects' relates to the environment as it would be in the future should the project not be carried out. As discussed in Section 3.2.1 in Chapter 3, the assessment period of this rEIAR commenced in 1988, a time at which peat extraction was already well-established at the Application Site. In the context of this rEIAR, the Project has been ongoing since the baseline assessment year of 1988. As outlined in Section 3.2.1 in Chapter 3, peat extraction activities commenced at the Application Site in 1948 with the installation of drainage.

The 'Do-Nothing' option is defined as the Project (as described in Section 4.2 of Chapter 4) having ceased at the Application Site in 1988.

In the event of the cessation of the Project at the Application Site in 1988, it is assumed that those lands which by that point had not been subject to the installation of drainage and peat extraction would have remained as a relatively intact raised bog with varying raised bog habitats (such as bog woodland, fen, sphagnum mosses).

Subsequently. other land-use practices may also have taken place on the Application Site such as agricultural or commercial forestry, or other commercial or non-commercial uses. Alternative land uses are discussed in Chapter 3 – Alternatives. Under this 'Do-Nothing' option, the IPC licence and associated ongoing decommissioning and planned rehabilitation would not have occurred.

For those lands which as of 1988 had been subject to the installation of drainage in preparation for peat extraction but not peat extraction itself, it is assumed in the 'do-nothing' scenario that drainage would have remained insitu. Maintenance works to keep established drainage channels clear would have ceased as of 1988 in the 'do-nothing' scenario. It is likely that these areas would have been subject to natural recolonisation of the bog surface. Minor third party turbary activities likely would have occurred along the intact bog edges as was common practise at sites such as the Application Site.

Peat extraction was underway at the Application Site prior to the required date for the transposition of the EIA Directive in 1988. If peat extraction and related activities ceased from 1988 onwards, then the various residual effects, described throughout this rEIAR, would not have occurred.

However, consideration must be given to the following:

- The legislative mandate given to the Applicant in the form of the Turf Development Act 1946, as amended) to acquire and develop peatlands; and
- The uncertainty with respect to the planning status of the activity did not arise until 2019 and was not evident in 1988.

Therefore, this 'Do-Nothing' option was not the chosen option. Peat extraction and all ancillary works have occurred at the Application Site from July 1988 onwards. A decision to cease peat extraction at the Application Site was taken in 2020 and the Application Site needs to be considered in the context of regularising (without prejudice) the planning status of the lands to facilitate future development (subject to planning consent as required). The Application Site has and will continue to revegetate, and there will be a change from areas of cutover peatland to revegetated peatland. These are described in the individual chapters of the rEIAR.

In the event that Substitute Consent is not granted in effect, the "do nothing" option represents the current situation as at the date of the application for Substitute Consent. As part of the Applicant's statutory obligations under IPC licence requirements, Cutaway Bog Decommissioning and Rehabilitation Plans will continue to be implemented for the Application Site separate to, and independent of, the Substitute Consent application. The implementation of the plans is included in the impact assessment below.

The role of cutaway/cutover peatlands such as the Application Site as a significant potential resource for amenity, tourism, biodiversity enhancement and conservation, improvement in air quality, climate mitigation, renewable energy development and education are part of the Applicant 's vision for the Application Site. The regularisation of the planning status of the Application Site is a significant facilitator in ensuring the sustainable use and management of these peatlands. If this does not occur, the opportunity to continue employment and alternative use of the Application Site for the potential resources and activities mentioned above will be significantly restricted.

5.6.2 Peat Extraction Phase (July 1988 - June 2020)

5.6.2.1 Land Use

Identification and Description of Impact

The Application Site was subject to industrial peat extraction activities and all ancillary works from July 1988 to June 2020. Installation of drains and clearance of vegetation was undertaken at the Ballivor, Carranstown, Bracklin, Lisclogher-West and Lisclogher Bog Groups, with most of the drainage already being inserted by 1988. Permanent railway lines were laid down and peat extraction was underway on each of the bog units except Lisclogher West by 1988.

Ongoing peat extraction activities and all ancillary works during the Peat Extraction Phase had a long-term, significant, negative effect on land use.

Control Measures

Control measures were in place at the Application Site under the IPC Licence which came into effect from 2000 onwards. The following control measure is relevant in terms of land use:

> *Condition 4*
>
> *4.1 The license shall notify the Agency by both telephone and facsimile, if available, to the Agency's Headquarters in Wexford, or to such other Agency office as may be specified by the Agency, as soon as practicable after the occurrence of any of the following: 4.1.3 Any incident with the potential for environmental contamination of surface water or groundwater, or posing an environmental threat to air or land, or requiring an emergency response by a Local Authority.*

Residual Effect

Ongoing peat extraction activities and all ancillary works during the Peat Extraction Phase had a long-term, significant, negative residual effect on land use.

Significance of Effects

Based on the assessment above, there were significant direct effects on land use during the Peat Extraction Phase.

5.6.2.2 Population

Identification and Description of Impact

The initial attraction of settlers to the area in the 1940s and 1950s for long term employment is considered to have created a boost to population levels. Ongoing peat extraction activities and all ancillary works facilitated a stabilisation of population due to employment opportunities and the corresponding development of services.

Ongoing peat extraction activities and all ancillary works during the Peat Extraction Phase had a long-term, slight, positive effect on population.

Control Measures

No control measures were undertaken.

Residual Effect

Ongoing peat extraction activities and all ancillary works during the Peat Extraction Phase had a long-term, slight, positive residual effect on population.

Significance of Effects

Based on the assessment above, there was no significant direct or indirect effects on population during the Peat Extraction Phase.

5.6.2.2.2 *Employment and Economic Activity*

Identification and Description of Impact

As discussed, the Applicant has been the leading commercial employer for rural communities of the Midlands of Ireland since the late 1950s, employing thousands of workers permanently throughout the decades, both directly in the peat extraction industry and indirectly, through the horticultural industry. The decades long peat extraction activities and all ancillary works undertaken at the Application Site had a long term, significant, positive effect on employment and economic activity during the Peat Extraction Phase. Employment numbers at the Application Site leading up to the permanent cessation of activities were significantly lower than in 1988, as discussed in section 5.4.1.2. Since 2000, continuous environmental monitoring and maintenance has been undertaken as required under the IPC Licence P0501-01, which has required staff to complete and has thus contributed to employment levels. the Applicant provided ongoing, albeit limited, employment through the extraction of peat until June 2020 and removal of stockpiles from the bogs up to the end of 2023.

Control Measures

When peat extraction activities and all ancillary works ceased in June 2020, where possible, the Applicant provided retraining to employees at the Application Site and provided employment in other Bord na Móna departments and locations. Additionally, in the planning of the cessation of peat extraction across the Bord na Móna landbank, strategies such as the Brown to Green strategy, which involves the transformation of the Applicant from a traditional peat business into a climate solutions company, were being devised. This strategy aimed to facilitate the transition from peat-based activities into opportunities in the Applicant's green businesses and peatland rehabilitation activities, and in doing so, to provide replacement and new employment opportunities.

Residual Effect

The decades long peat extraction activities and all ancillary works undertaken at the Application Site had a long term, significant, positive residual effect on the local economy by supporting employment directly to the local community, the rural Midlands, and the Nation as a whole. The decrease in employment at the Application Site due to advances in mechanisation and technology, creation of autonomous work groups and redundancies across the Applicant's peat bog sites in recent decades, has had a long-term, moderate, negative residual effect on employment local community, the rural Midlands, and the Nation as a whole during this period.

Significance of Effects

Based on the assessment above, there was significant direct effects on employment and economic activity during the Peat Extraction Phase.

5.6.2.2.3 *Access & Transport*

Identification and Description of Impact

Peat extraction activities and all ancillary works at the Application Site would have generated additional traffic onto public roads through the delivery of peat from the Application Site to various end users around the country. Vehicles transporting peat had the potential to emit dust and soil roads. Rail passings of laden and unladen wagons were required to cross the public road network potentially impacting traffic flow and could have caused accidents. An impact assessment of the additional traffic generated by the Applicant in the transportation of peat from the Application Site to various end users around the country is assessed discussed in Chapter 14 Material Assets.

The addition of traffic on the road and potential for traffic disruption due to rail car passings during the Peat Extraction Phase is considered to have had a long term, slight, negative effect.

Dust and CO_2 emissions as well as Noise and Vibration emissions generated by deliveries and from the onsite railway infrastructure are assessed Chapter 9 Air Quality, Chapter 10 Climate, Chapter 11 Noise and Vibration, Chapter 14 Material Assets, and Chapter 15 Vulnerability to Major Accidents and Natural Disasters.

Control Measures

Control measures implemented at the site prior to 1988 which are still in force today are as follows:

1. *All machinery including road vehicles were regularly inspected, serviced. All machinery was regularly cleaned via power steam wash system at a wash bay and drained into an interceptor tank and associated gravel soak pit. The interceptor unit facilitated the removal of any floatable oil/grease components. This was done to minimise dust and particle release;*
2. *Clean road crossings to ensure no peat was tracked across public roads;*
3. *All vehicles utilise the wheel wash prior to entering the local road network;*
4. *Road transported peat is adequately covered (sheeted or similar);*
5. *Transportation of peat is undertaken outside peak travel hours;*
6. *Railway tracks and railway locomotives underwent continuous inspection and maintenance to prevent de-railments, fires, accidents and fuel leaks;*
7. *The locomotives are fitted with beam lighting, electric windscreen wipers and driving mirrors for both directions of travel; and*
8. *Wagons are also designate as fire safety wagons and are stocked with various fire safety paraphernalia including hoses, buckets, breathing apparatus, first aid kit, drums of foam and foam making machine, extinguishers.*

Residual Effect

The addition of traffic on the road and potential for traffic disruption due to rail car passings during the Peat Extraction Phase is considered to have had a long term, imperceptible, negative residual effect.

Significance of Effects

Based on the assessment above, there was no significant direct or indirect effects on access and transport during the Peat Extraction Phase.

5.6.2.2.4 *Housing*

Identification and Description of Impact

The Applicant directly contributed to the quantum of housing in the local area by constructing 9. no houses in Ballivor Village in 1956 for employees at Application Site and further housing was built by the Applicant all over Counties Meath and Westmeath as indicated in section 5.4.5 above. These houses were still occupied in 2020 by private owners. Ongoing peat extraction activities and all ancillary works during the Peat Extraction Phase had a long-term, moderate, positive effect on housing.

Control Measures

No control measures were undertaken.

Residual Effect

The industrial peat extraction activities and all ancillary works initially had a long term, moderate, positive residual effect on housing but in recent years no impact on existing housing levels would have occurred.

Significance of Effects

Based on the assessment above, there was no significant direct or indirect effects on housing during the Peat Extraction Phase.

5.6.2.3 Human Health

5.6.2.3.1 *Air Quality & Climate- Dust, NO2, PM10, PM2.5 and CO2 Emissions*

Identification and Description of Impact

Peat extraction activities and all ancillary works would have generated dust impacts at nearby properties within the Study Area. The milling, harrowing, ridging and harvesting processes would have generated some dust emissions. Dust impacts would have typically occurred within 250m of the Application Site with the majority of deposition occurring within the first 50m. Dust deposition monitoring carried out on the Application Site and reported within the AERs (Appendix 4-3) indicated that there have been zero complaints in relation to dust emissions and only one non-compliance event (in 2007) over the period 2007 – 2022.

Long-term monitoring of NO_2, PM_{10} and PM_{25} at nearby monitoring stations or comparative locations indicate there were no exceedances to the daily or annual thresholds of NO_2, PM_{10} and $PM_{2.5}$. Please see Chapter 9 Air Quality for details. A total of 2,703,053 tCO_2 was directly or indirectly removed over the 1988 – 2020 period through peat extraction activities and all ancillary works. Please see Chapter 10 Climate for details. Over this 33-year period there was on average 81,911 tonnes of CO_2 per annum removed from the Ballivor, Bracklin, Carranstown and Lisclogher bogs. Annually this equates to 0.03% of Ireland's 2021 – 2025 carbon budget of 295 $MtCO_2e$ or 0.05% of Ireland's more stringent 2030 – 2035 carbon budget of 151 $MtCO_2e$.

Ongoing peat extraction activities and all ancillary works during the Peat Extraction Phase had a permanent, moderate, negative effect on air quality and climate.

Control Measures

Dust emissions were higher from the milled peat extraction process than the sod peat extraction process. The following measures were undertaken as part of general site management and daily operation procedures at the Application Site from the onset of extraction in the 1950s to the cessation in 2020.

- Stockpiles were compacted on either side by large rollers drawn by tractors;
- Stockpiles were covered with polythene film gauge sheets and secured in position by spreading an even layer of high moisture content milled peat;
- Extraction was avoided during windy weather;
- Headlands were kept clean and loose peat removed;
- Driving speeds were kept slow along dusty headlands; and,
- Road crossings were kept clean.

Further to the above, since 2000, monitoring for dust deposition has been undertaken at the Application Site as a requirement of Condition 5 of the IPC Licence for the site.

Condition 5 Emissions to Air:

Activities on-site shall not give rise to dust levels off site at any Dust Sensitive Location which exceed an emission limit of 350 mg/m^2/day. [The sampling method to be in accordance with German TA Luft Immission Standards for Particle Deposition (IW1)].

In relation to Dust Control the licensee shall, within six months of date of grant of this licence, develop and implement procedures to ensure that:

- *shelter belts are planted in sensitive areas,*
- *harvesting in sensitive areas is avoided during windy weather,*
- *where possible machinery use grassed pathways,*
- *headlands are kept clean and free of excessive loose peat,*
- *stockpiles are sheeted where possible,*
- *moving machinery maintains slow speeds when travelling along dusty headlands,*
- *when harvesting, the jib is maintained low to the stockpile,*
- *shelter belts are planted around outloading facilities,*
- *road transported peat is adequately covered (sheeted or similar),*
- *wind breaks are planted where-ever possible.*

No further control measures were undertaken.

Residual Effect

Given the extensive control measures carried out at the Application Site prior to the IPC Licence combined with the dust monitoring and condition compliance since 2000, it is considered that dust emissions from the peat extraction activities and all ancillary works and related activities had a localised long-term, negative imperceptible impact on air quality.

Emissions of NO_2, PM_{10} and PM_{25} generated from the peat extraction activities and all ancillary works activities had a localised long-term, negative imperceptible residual effect on air quality. Please see Chapter 9 Air Quality for further details.

The removal of the carbon sink potential of the site and the subsequent release of CO_2 from the peat extraction activities and all ancillary works activities resulted in a long-term, negative significant residual effect on climate. Please see Chapter 10 Climate for further details.

Significance of Effects

Based on the assessment above, there was no significant direct or indirect effects on air quality during the Peat Extraction Phase. There was a significant effect on climate during the Peat Extraction Phase.

5.6.2.3.2 *Water Quality*

Identification and Description of Impact

The potential for the peat extraction activities and all ancillary works to impact the hydrogeology of the Ballivor Public Water Supply is low as the bog drainage regime was already largely in place at the time the source boreholes were drilled (1994). The natural hydrological and hydrogeological regime of peat bogs, with little groundwater recharge and high runoff rates, also limit the potential effects that peat extraction activities and all ancillary works may have had on local groundwater abstractions including the Ballivor Public Water Supply.

Impacts from the accidental spillage of petroleum hydrocarbons during refuelling of machinery and the accumulation of small spills of fuels and lubricants during routine plant use can have a significant effect on the geological and water environment which can in turn be harmful to human health. Please see Chapter 8 Hydrology and Hydrogeology for details.

Ongoing peat extraction activities and all ancillary works during the Peat Extraction Phase had a long term, imperceptible, negative effect on water quality.

Control Measures

No control measures to minimise impacts on the public water supply would have been necessary due to the shallow nature of the works and the nature of the local hydrogeological regime.

In the period between 1988 and 2000 (i.e. before the IPC Licence took effect at the Application Site), control measures had been adopted by the Applicant to protect water quality. These measures related to machinery maintenance and storage, refuelling facilities, surface water management, a maintenance programme for internal drains, maintenance of onsite water pumps, and silt management; these measures have been outlined in Sections 4.3.5.1 to 4.3.5.9 of Chapter 4. Since 2000, the Application Site has been operated under IPC Licence and a Surface Water Management Plan. Furthermore, no reports of leaks, spills or contamination has been reported since the commencement of Annual Environmental Reporting to the EPA. Please see please see Chapter 8 Hydrology and Hydrogeology for further details.

Residual Effect

The Application Site is not located within the mapped SPA of the Ballivor Public Water Supply.

Due to the Application Site's compliance with conditions set out in the licence pertaining to emissions to water, there has not been a significant effect on downstream surface water or ground water quality as a result of leaks and spills during the peat extraction phase of the project.

Ongoing peat extraction activities and all ancillary works during the Peat Extraction Phase had a long term, imperceptible, negative residual effect on water quality.

Significance of Effects

Based on the assessment above, there was no significant direct or indirect effects on water quality during the Peat Extraction Phase.

5.6.2.3.3 *Noise*

Identification and Description of Impact

As discussed, potential noise impacts from plant and equipment would have been experienced intermittently during active periods of peat extraction due to the continuous movement of machinery around the bogs, i.e., no machinery operated continuously in the one location near sensitive receptors. As peat extraction activities wound down at the Application Site, the potential for noise impacts decreased. Ongoing peat extraction activities and all ancillary works during the Peat Extraction Phase had a long term, slight, negative effect on noise.

Control Measures

Prior to 2000, control measures pertaining to noise comprised of machinery maintenance:

1. *All peat harvesting machinery listed above in section 4.2.4 were stored at the Ballivor Works at the end of the workday.*
2. *All machinery were regularly inspected, serviced.*
3. *Railway tracks and railway locomotives underwent continuous inspection and maintenance*

Since 2000, Application Site has been operating under IPC Licence control and a noise limit, detailed in section 5.5.3 above, has been set for the activities on site**.** As peat extraction was underway across all bogs except Lisclogher West in the early 2000s, it is considered, similar noise emissions would have occurred from 1988 to 2000. Any incidents of noise exceedances and noise complaints must be included in the AERs. There have been no incidents of noise exceedances or noise-related complaints at the site since the onset of the IPC Licence requirements in 2000.

Residual Effect

Ongoing peat extraction activities and all ancillary works during the Peat Extraction Phase had a long term, slight, negative residual effect on noise.

Significance of Effects

Based on the assessment above, there was no significant direct or indirect effects on noise during the Peat Extraction Phase.

5.6.2.3.4 *Health and Safety*

Identification and Description of Impact

The Application Site was under operation as an industrial peat extraction site, which necessitated the use of machinery, and incurred travel on the local public road network to and from the Application Site. Peat extraction sites and the machinery used on them pose a potential health and safety hazard to workers if site rules are not properly adhered to.

There was potential for bog fires occurring due to inappropriate on-site bog management, via external sources and through natural events caused by dry weather. Storage of potential sources of pollution on

site, such as bulk storage of hydrocarbons or chemicals, storage of wastes, had the potential to cause significant environmental pollution and associated negative effects on health. Workplace accidents could occur in industrial, large-scale settings.

Bog fires have occurred during dry summer periods and, as a condition of the IPC Licence, are reported to the EPA in the Annual Environmental Reports.

Sources of pollution with the potential to cause significant environmental pollution and associated negative effects on health such as bulk storage of hydrocarbons or chemicals, storage of wastes etc are subject to the conditions of the IPC Licence. Please see Appendix 4-1 for details.

The sites are not connected to or close to any site regulated under the Control of Major Accident Hazards Involving Dangerous Substances Regulations i.e. SEVESO sites, and so there is no potential effects from this source.

Ongoing peat extraction activities and all ancillary works during the Peat Extraction Phase had a long term, slight, negative effect on health and safety.

Control Measures

The Applicant has long been a cognisant of Health and Safety. Following a number of explosions in Lullymore Briquette Factory in the late 1940s and early 1950s[11], the comprehensive scheme for accident prevention was devised[12]. In 1958, a permanent committee was established within Bord na Móna to administer accident prevention schemes. Each Works site had a first aid team consisting of trained volunteers who partook in regular training and administered first aid as required during operations. In 1981, a new safety policy was adopted across the company. Health and Safety has been an evolving field since 1988, with improvements being made to the Applicant's health and safety policies over the years. This has been aided by the introduction of Safety Health & Welfare at Work Act 2005, the SHWW (General Application) Regulations 2007, as amended, and the SHWW Construction Regulations, 2013. The Applicant provides various training to their employees to minimise any negative impacts on health and safety on all of their sites.

The Applicant have produced and implement an annual Health and Safety Statement which aims to:

1. *Comply, as a minimum, with all statutory requirements, common law duties, codes of practice and best industry practice relating to our activities, including the Safety Health & Welfare at Work Act 2005, the SHWW (General Application) Regulations 2007, as amended, and the SHWW Construction Regulations, 2013;*
2. *Provide and maintain a safe and healthy place of work & working conditions, and to develop & maintain safe systems of work;*
3. *Ensure adequate resources, structures and systems to effectively manage workplace safety, health and welfare;*
4. *Identify all workplace hazards, assess the associated risks, implement appropriate control measures, taking account of the principles of prevention, to eliminate where possible or minimise such risks to acceptable levels, and monitor their effectiveness;*
5. *Provide information, instruction and training - in a manner and language understood by the trainee - and supervision to enable employees to perform their work safely and effectively;*
6. *Provide necessary protective equipment and safety devices and supervise their use;*
7. *Protect, as far as is reasonably practicable, persons not employed by the company who may be affected by our activities;*
8. *Ensure contractors and service providers comply with company safety requirements;*

[11] *Donal Clarke (2010) Brown Gold: A History of Bord na Móna and the Irish Peat Industry, pp. 84*
[12] *Donal Clarke (2010) Brown Gold: A History of Bord na Móna and the Irish Peat Industry, pp. 102*

9. *Strive to continuously improve health and safety management based on performance monitoring and in line with changes in legislation and best practice;*
10. *Build on its safety culture & continue to raise health & safety awareness amongst employees;*
11. *Consult with employees and contractors on matters of health, safety & welfare and take account of representations made by employees on such matters; and*
12. *Review this policy & the safety statement, as per legislative requirements, and to ensure their validity and effectiveness.*

Fire safety and awareness is provided as part of the Applicants general safety induction with reoccurring refresher training every three years. Please see Appendix 5-1 Fire Prevention & Fire Fighting Procedures for Peat Production Bogs for further details.

Condition 13 of the IPC Licence states that it is the responsibility of the licence holder (the Applicant) to ensure that a documented Emergency Response Procedure is in place which shall address any emergency situation which may originate on-site. This Procedure includes provision for minimising the effects of any emergency on the environment.

Residual Effect

Ongoing peat extraction activities and all ancillary works during the Peat Extraction Phase had a long term, imperceptible, negative residual effect on health and safety.

Significance of Effects

Based on the assessment above, there was no significant direct or indirect effects on health and safety during the Peat Extraction Phase.

5.6.2.3.5 *Vulnerability to Natural Disasters*

Identification and Description of Impact

Bog Fires, Landslides and Flooding

As discussed in Section 5.5.5, the types of natural disasters that could occur at the Application Site are bog fires, landslides and flooding events.

A bog fire occurred at Lisclogher West and Lisclogher bogs in 2008. This fire occurred due to dry weather conditions. In both cases, the EPA was contacted, and corrective measures were put in place and the fires were brought under control. No Bord na Móna staff or third parties were involved in the outbreak of the fire and the fires were contained by Bord na Móna staff within the Application Site boundary.

The closest recorded landslide event (1999) is mapped at Girley Bog, Chamberlainstown, approximately 12km northeast of Lisclogher Bog. Girley Bog is classed as a raised intact bog. “No apparent Impact” is recorded for this event.

The GSI Landslide Susceptibility Map (www.gsi.ie) classifies the probability of a landslide occurring at Application Site as Low. This is due to the sites relatively flat topography.

Ongoing peat extraction activities and all ancillary works during the Peat Extraction Phase had a potential long term, moderate, negative effect on the Project’s vulnerability to natural disasters.

For full details on the vulnerability of the Project to major accidents and natural disasters, please see Chapter 15 of this rEIAR.

Control Measures

Control measures implemented at the Application Site are detailed in Appendix 5-1 Fire Prevention and Fire Fighting Procedures for Peat Production Bogs and Appendix 5-2 Bord na Móna Health and Safety Statement.

Residual Effect

Due to the comprehensive fire management and training procedures implemented at the Application Site, the potential for internal source fires were very low. There was one recorded bog fire at the Application Site in 2008. Due to the flat topography of the Application Site, the possibility of a landslides was and are considered low. The potential for flooding at the Application Site was and is also considered low.

As such, ongoing peat extraction activities and all ancillary works during the Peat Extraction Phase had a long term, slight, negative residual effect on human health and those residing in the surrounding landscape due to the potential for natural disasters at the Application Site.

Significance of Effects

Based on the assessment above, there was no significant direct or indirect effects on the vulnerability of the Project to natural disasters during the Peat Extraction Phase.

5.6.3 Current Phase (June 2020 to Present Day)

5.6.3.1 Land Use

Identification and Description of Impact

Peat extraction activities and all ancillary works ceased at the Application Site in June 2020, therefore no peat extraction works are occurring at the Application Site during the Current Phase. Cutaway Bog Decommissioning and Rehabilitation Plans are being drafted and implemented as required (see Appendix 4-2).

The cessation of peat extraction activities and all ancillary works during the Current Phase have resulted in a short-term, moderate, positive effect on land use.

Control Measures

Control measures were in place at the Application Site under the IPC Licence which came into effect from 2000 onwards. The following control measure is relevant in terms of land use for the Current Phase:

> *Condition 4*
>
> *4.1 The license shall notify the Agency by both telephone and facsimile, if available, to the Agency's Headquarters in Wexford, or to such other Agency office as may be specified by the Agency, as soon as practicable after the occurrence of any of the following:4.1.3 Any incident with the potential for environmental contamination of surface water or groundwater, or posing an environmental threat to air or land, or requiring an emergency response by a Local Authority.*
>
> *Condition 10*

10.1 Following termination of use or involvement of all or part of the site in the licensed activity, the licensee shall:

10.1.1 Decommission, render safe or remove for disposal/recovery, any soil, subsoils, buildings, plant or equipment, or any waste, materials or substances or other matter contained therein or thereon, that may result in environmental pollution.

10.1.2 Implement the agreed cutaway bog rehabilitation plan.

Residual Effect

Since the cessation of peat extraction activities and all ancillary works in June 2020, it is considered that there has been a short-term, moderate, positive residual effect on land use.

Significance of Effects

Based on the assessment above, there are no significant direct or indirect effects on land use during the Current Phase.

5.6.3.2 Population

Identification and Description of Impact

The initial attraction of settlers to the area in the 1940s and 1950s for long term industrial-scale employment resulted in a generational increase in population levels over the decades. The cessation of peat extraction activities and all ancillary works during the Current Phase have resulted in a short-term, imperceptible, neutral effect on population.

Control Measures

No control measures are proposed.

Residual Effect

The cessation of peat extraction, and continuation of all other activities during the Current Phase have resulted in a short-term, imperceptible, neutral residual effect on population.

Significance of Effects

Based on the assessment above, there are no significant direct or indirect effects on population during the Current Phase.

5.6.3.2.2 *Employment and Economic Activity*

Identification and Description of Impact

Peat extraction ceased at the Application Site in June 2020 and all existing stockpiles of peat were removed off the bogs by the end of 2023. The Applicant still provides employment at the Application Site through environmental monitoring and maintenance as required under the IPC Licence P0501-01 and through the Peatland Climate Action Scheme (PCAS). Please see Chapter 4 for details.

The cessation of peat extraction activities and all ancillary works during the Current Phase have resulted in a short-term, slight, negative effect on employment and economic activity.

Control Measures

No control measures are proposed for the current phase.

Residual Effect

The cessation of peat extraction in June 2020, has had a short-term, slight, negative residual effect on employment and economic activity in the local community and the rural Midlands.

However, where possible, the Applicant has redeployed and retrained peat extraction employees in other sectors in its *Brown to Green* transition, thus minimising job loss within the company. The Applicant has created jobs through the development of climate solutions on its vast land banks, such as renewable energy. One such example is the potential development of the proposed Ballivor Wind Farm (Ref. PA25M.316212) which is estimated to create between 100-120 jobs at peak construction, 2-3 permanent jobs for the operational lifetime and 20-40 jobs during its decommissioning phase.

Significance of Effects

Based on the assessment above, there are no significant direct or indirect effects on employment and economic activity during the Current Phase.

5.6.3.2.3 *Access & Transport*

Identification and Description of Impact

Traffic movements to and from the Application Site are considerably lower than during the Peat Extraction Phase and are limited to personal vehicles arriving and departing the Application Site and occasional tractor and excavator plant required to undertake works on the Application Site in line with IPC Licence and Peatland Climate Action Scheme (PCAS) requirements. There is approximately one rail movement across the Application Site per week for maintenance purposes. The cessation of peat extraction activities at the onset of the Current Phase has resulted in a short-term, imperceptible, negative effect on access and transport.

Control Measures

Control measures implemented at the Application Site prior to June 2020 which are still in force today, where relevant, are as follows:

1. *All machinery including road vehicles were regularly inspected, serviced. All machinery was regularly cleaned via power steam wash system at a wash bay and drained into an interceptor tank and associated gravel soak pit. The interceptor unit facilitated the removal of any floatable oil/grease components. This was done to minimise dust and particle release;*
2. *Clean road crossings to ensure no peat was tracked across public roads;*
3. *All vehicles utilise the wheel wash prior to entering the local road network;*
4. *Road-transported peat is adequately covered (sheeted or similar); and*
5. *Transportation of peat is undertaken outside peak travel hours.*

Residual Effect

The cessation of peat extraction at the onset of the Current Phase, and the continuation of all other activities (as described in Section 4.8 of Chapter 4 Description of Development) during the Current Phase have resulted in a short-term, imperceptible, negative residual effect on access and transport.

Significance of Effects

Based on the assessment above, there are no significant direct or indirect effects on access and transport during the Current Phase.

5.6.3.2.4 *Housing*

Identification and Description of Impact

As discussed in Section 5.4.5 above, the Applicant constructed housing for its employees in Counties Meath and Westmeath. These houses are still occupied during the present day during the Current Phase by private landowners.

The cessation of peat extraction activities and all ancillary works during the Current Phase have resulted in a short-term, imperceptible, positive effect on housing.

Control Measures

No control measures are proposed.

Residual Effect

The cessation of peat extraction at the onset of the Current Phase, and the continuation of all other activities (as described in Section 4.8 of Chapter 4 Description of Development) during the Current Phase have resulted in a short-term, imperceptible, positive residual effect on housing.

Significance of Effects

Based on the assessment above, there are no significant direct or indirect effects on housing during the Current Phase.

5.6.3.3 Human Health

5.6.3.3.1 *Air Quality & Climate - Dust, NO_2, PM_{10} and PM_{25}, CO_2*

Identification and Description of Impact

Emissions of dust and air pollutants have decreased significantly over the years due to the winding down of peat extraction at the Application Site. As discussed above, emissions during the Peat Extraction Phase were not considered significant and no breaches of emissions limits occurred, or complaints were received. Since the cessation of peat extraction at the onset of the Current Phase, emissions are considered to be significantly less than during the Peat Extraction Phase. As such, effects on air quality and climate during the Current Phase are considered to be short-term, imperceptible and negative.

Control Measures

The following measures are undertaken as part of general site management and daily operation procedures at the Application Site since June 2020.

- Up until the removal of stockpiles from the Application Site by the end of 2023, stockpiles were compacted on either side by large rollers drawn by tractors;

- Up until the removal of stockpiles from the Application Site by the end of 2023, stockpiles were covered with polythene film gauge sheets and secured in position by spreading an even layer of high moisture content milled peat;
- Headlands were kept clean and loose peat removed;
- Driving speeds were kept slow along dusty headlands; and,
- Road crossings were kept clean.

In addition to the above, drain blocking as part of PCAS is underway at Carranstown, Lisclogher West and Bracklin West. Please see Chapter 4 for details on the Peatland Climate Action Scheme (PCAS).

Residual Effect

The cessation of peat extraction at the onset of the Current Phase, and the continuation of all other activities (as described in Section 4.8 of Chapter 4 Description of Development) during the Current Phase have resulted in a short-term, imperceptible, negative residual effect on air quality and climate.

Significance of Effects

Based on the assessment above, there are no significant direct or indirect effects on air quality and climate during the Current Phase.

5.6.3.3.2 *Water Quality*

Identification and Description of Impact

There is potential for impacts on groundwater and surface water through accidental leaks and spills of hydrocarbons during the refuelling process, despite the limited activity at the Application Site during the Current Phase. Similarly, discharges from the Ballivor Works and welfare facilities have the potential to cause surface water and groundwater contamination.

No effect on local groundwater abstractions will have occurred since the cessation of peat extraction in June 2020 to the present day. Drainage and hydrogeology of the Application Site are unchanged during this period.

The cessation of peat extraction at the onset of the Current Phase, and the continuation of all other activities (as described in Section 4.8 of Chapter 4 Description of Development) during the Current Phase have resulted in a short-term, imperceptible, negative effect on water quality.

Control Measures

Any works during this time period have been completed under IPC Licence from the EPA, and Bord na Mona's Environmental Management System. Since 2000 the Application Site has been compliant with the conditions set out in the IPC Licence.

Since 2000, the Application Site has been regulated by the EPA under IPC Licence and a Surface Water Management Plan. Furthermore, no reports of leaks, spills or contamination has been reported since the commencement of Annual Environmental Reporting to the EPA. Please see please see Chapter 8 Hydrology and Hydrogeology for further details.

Residual Effect

The cessation of peat extraction at the onset of the Current Phase, and the continuation of all other activities (as described in Section 4.8 of Chapter 4 Description of Development) during the Current Phase have resulted in a short-term, imperceptible, negative residual effect on water quality.

Significance of Effects

Based on the assessment above, there are no significant direct or indirect effects on water quality during the Current Phase.

5.6.3.3.3 *Noise*

Identification and Description of Impact

The Current Phase involves the continuous environmental maintenance and monitoring, and the intermittent use of tractors and excavators to facilitate drain maintenance. The potential for noise impacts is considerably reduced in comparison to the Peat Extraction Phase.

Control Measures

The Application Site operates under IPC Licence conditions, detailed in Section 5.5.3 above. There have been no incidents of noise exceedances or noise related complaints at the Application Site since the granting of the IPC Licence in 2000.

Residual Effect

The cessation of peat extraction at the onset of the Current Phase, and the continuation of all other activities (as described in Section 4.8 of Chapter 4 Description of Development) during the Current Phase have resulted in a short-term, imperceptible, negative residual effect on noise.

Significance of Effects

Based on the assessment above, there are no significant direct or indirect effects on noise during the Current Phase.

5.6.3.3.4 *Health and Safety*

Identification and Description of Impact

The emergency response procedures detailed in Appendix 5-2 Bord na Mona Health and Safety Statement are still implemented at the Application Site today. Since peat extraction has ceased and activity levels at the Application Site have reduced considerably since June 2020, it is considered that the potential for health and safety incidents on the Application Site are reduced when compared to the Peat Extraction Phase.

The cessation of peat extraction at the onset of the Current Phase, and the continuation of all other activities (as described in Section 4.8 of Chapter 4 Description of Development) during the Current Phase have resulted in a short-term, slight, neutral effect on health and safety.

Control Measures

Control measures undertaken during the Peat Extraction Phase (as outlined in Section 5.6.2.3.4) and detailed in Appendix 5-2 Bord na Móna Health and Safety Statement are still in operation at the site.

Residual Effect

The cessation of peat extraction at the onset of the Current Phase, and the continuation of all other activities (as described in Section 4.8 of Chapter 4 Description of Development) during the Current Phase have resulted in a short-term, imperceptible, negative residual effect on health and safety.

Significance of Effects

Based on the assessment above, there are no significant direct or indirect effects on health and safety during the Current Phase.

5.6.3.3.5 *Vulnerability to Natural Disasters*

Identification and Description of Impact

Bog Fires, Landslides and Flooding

No peat extraction has occurred at the Application Site since June 2020. Therefore, no significant change in topography and/or drainage has occurred during the Current Phase. The risk of peat failure at the site remains low. Since the cessation of peat extraction, the frequency of refuelling activities has decreased significantly. As such, the potential for internal source fires has also decreased. The potential for bog fires due to dry weather conditions remains, but this occurrence is rare. Drainage works on site are continuously maintained and inspected by onsite staff. There has been no recorded floods or landslides since the onset of activities in the 1940s

A Peat Stability Assessment was undertaken at the site in 2021 by Fehily Timoney to assess the susceptibility of the site to peat failure following the principles in Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (PLHRAG, Scottish Government, 2017). The findings, which involved analysis of approximately 300 locations, show that the Application Site has an acceptable margin of safety with regard peat stability. Slope inclinations across the Application Site range from 2 to 4 degrees and therefore, the flat topography/nature of the terrain on site reflects the low risk of peat failure.

The Peat Stability Assessment concluded that the stability i.e., Factor of Safety (FoS), of the peat slopes for the site has an acceptable value of 1.3 (FoS of less than 1.0 indicates an unstable slope and a FoS of greater than 1.0 indicating a stable slope).

Control Measures

Control measures implemented at the site are detailed in Appendix 5-1 Fire Prevention and Fire Fighting Procedures for Peat Production Bogs and Appendix 5-2 Bord na Móna Health and Safety Statement.

Residual Effect

The cessation of peat extraction at the onset of the Current Phase, and the continuation of all other activities (as described in Section 4.8 of Chapter 4 Description of Development) during the Current Phase have resulted in a short-term, imperceptible, negative residual effect on the Project's vulnerability to natural disasters. For full details on the vulnerability of the Project to natural disasters, please see Chapter 15 of this rEIAR.

Significance of Effects

Based on the assessment above, there was no significant direct or indirect effects on the vulnerability of the Project to natural disasters during the Current Phase.

5.6.4 Remedial Phase

5.6.4.1 Land Use

Identification and Description of Impact

The Remedial Phase of the Project involves the implementation of Cutaway Bog Decommissioning and Rehabilitation Plans as per Condition 10 of the IPC Licence. Mitigation Measures

Mitigation measures at the Application Site for the Remedial Phase are included under the IPC Licence which came into effect from 2000 onwards. The following mitigation measure is relevant in terms of land use for the Remedial Phase:

> *Condition 10*
>
> *10.1 Following termination of use or involvement of all or part of the site in the licensed activity, the licensee shall:*
>
> *10.1.2 Implement the agreed cutaway bog rehabilitation plan.*

Residual Effect

Bog rehabilitation during the Remedial Phase will have a long term, significant, positive effect on land use at the Application Site. The bog-specific Cutaway Bog Decommissioning and Rehabilitation Plans are provided in Appendix 4-2.

Significance of Effects

Based on the assessment above, there will be significant direct effects on land use during the Remedial Phase.

5.6.4.2 Population

Identification and Description of Impact

The Remedial Phase will involve the implementation of Cutaway Bog and Decommissioning and Rehabilitation Plans at the Application Site. Therefore, bog rehabilitation during the Remedial Phase will result in a long term, imperceptible, neutral effect on population.

Mitigation Measures

No mitigation measures are proposed.

Residual Effect

Bog rehabilitation during the Remedial Phase will result in a long term, imperceptible, neutral residual effect on population.

Significance of Effects

Based on the assessment above, there will be no significant direct or indirect effects on population during the Remedial Phase.

5.6.4.2.2 *Employment and Economic Activity*

Identification and Description of Impact

The implementation of the Cutaway Bog and Decommissioning and Rehabilitation Plans at the Application Site will require 3-4 no. staff for the first two years followed by 1-2 no. staff visiting monthly over 30 years.

As such, bog rehabilitation during the Remedial Phase will result in a long term, slight, positive effect on employment and economic activity.

Mitigation Measures

No mitigation measures are proposed.

Residual Effect

Bog rehabilitation during the Remedial Phase will result in a long term, slight, positive residual effect on employment and economic activity.

Significance of Effects

Based on the assessment above, there will be no significant direct or indirect effects on employment and economic activity during the Remedial Phase.

5.6.4.2.3 *Access & Transport*

Identification and Description of Impact

The Remedial Phase will involve lights good vehicle movements to and from the Application Site as personnel travel to and from the Application Site for work.

As such, bog rehabilitation during the Remedial Phase will result in a short term, negative, imperceptible residual effect on access and transport.

Mitigation Measures

The following mitigation measures will be implemented at the Application Site during the Remedial Phase:

1. *All HGVs used on site will undergo regular inspection and maintenance checks.*
2. *All HGVs used on site will undergo wheel washing prior to crossing the local road network to access other bogs or return to the Ballivor Works for storage.*
3. *Only HGV licence holders operated the HGVs and will undergo regular re-training on HGV safety operations and vehicle maintenance.*
4. *Refuelling of all HGV vehicles was undertaken at the Ballivor Works only.*
1. *Machinery crossing points on local roads between bogs were cleaned down at the end of each working day.*

2. *Car sharing by personnel and bike to work schemes will be encouraged. As part of Bord na Móna's vision for a climate neutral Ireland by 2050, the applicant encourages and promotes car sharing and cycle to work schemes where possible for its personnel.*

Residual Effect

Bog rehabilitation during the Remedial Phase will result in a short term, negative, imperceptible, residual effect access and transport.

Significance of Effects

Based on the assessment above, there will be no significant direct or indirect effects on access and transport during the Remedial Phase.

5.6.4.2.4 *Housing*

Identification and Description of Impact

Bog rehabilitation during the Remedial Phase will result in a long term, imperceptible, neutral effect on housing.

Mitigation Measures

No mitigation measures are proposed.

Residual Effect

The implementation of the Cutaway Bog and Decommissioning and Rehabilitation Plans is not considered to have an impact on housing.

Bog rehabilitation during the Remedial Phase will result in a long term, imperceptible, neutral residual effect on housing.

Significance of Effects

Based on the assessment above, there will be no significant direct or indirect effects on housing during the Remedial Phase.

5.6.4.3 Human Health

5.6.4.3.1 *Air Quality & Climate: Dust, NO_2, PM_{10} and $PM_{2.5}$, CO_2*

Identification and Description of Impact

The implementation of Cutaway Bog and Decommissioning and Rehabilitation Plans will involve limited machinery onsite to carry out drain blocking. Therefore, bog rehabilitation during the Remedial Phase will result in a long term, imperceptible, negative effect on air quality and climate.

Mitigation Measures

Control measures that are currently in operation at the Application Site will continue during the Remedial Phase. Monitoring that is taking place under IPC Licence will continue during the Remedial Phase.

Residual Effect

Bog rehabilitation during the Remedial Phase will result in a long term, imperceptible, neutral residual effect on air quality and climate.

Significance of Effects

Based on the assessment above, there will be no significant direct or indirect effects on air quality and climate during the Remedial Phase.

5.6.4.3.2 *Water Quality*

Identification and Description of Impact

The overall aim of the Cutaway Bog and Decommissioning and Rehabilitation Plans is to put the bogs on a trajectory towards becoming naturally functioning peatlands and improve water quality. Following the implementation of the proposed Cutaway Bog and Decommissioning and Rehabilitation Plans, the bogs will be wetter, retain more water, re-colonise with vegetation slowly, and they will eventually become naturally functioning peatlands with much-reduced silt and nutrient output. Therefore, bog rehabilitation during the Remedial Phase will result in a long term, slight, positive effect on water quality.

Mitigation Measures

Any works undertaken as part of the Cutaway Bog and Decommissioning and Rehabilitation Plans will be completed under IPC Licence, with the Applicant reporting to the EPA until the IPC Licence is surrendered. The existing key drainage systems which have proven effective will continue to operate as required during this period. The Cutaway Bog Decommissioning and Rehabilitation Plans state that the effects of any management activities will be monitored and assessed.

Residual Effect

Bog rehabilitation during the Remedial Phase will result in a long term, slight, positive residual effect on water quality.

Significance of Effects

Based on the assessment above, there will be no significant direct or indirect effects on water quality during the Remedial Phase.

5.6.4.3.3 *Noise*

Identification and Description of Impact

There will be limited machinery on the Application Site to carry out works required as part of the Cutaway Bog Decommissioning and Rehabilitation Plans during the Remedial Phase.

Mitigation Measures

Noise limits included under the IPC Licence, detailed in Section 5.5.3 above, will still be complied for future rehabilitation activities as part of the Remedial Phase.

Residual Effect

Bog rehabilitation during the Remedial Phase will result in a long term, imperceptible, negative residual effect on noise.

Significance of Effects

Based on the assessment above, there will be no significant direct or indirect effects on noise during the Remedial Phase.

5.6.4.3.4 *Health and Safety*

Identification and Description of Impact

The emergency response procedures detailed in Appendix 5-2 Bord na Mona Health and Safety Statement will continue to be implemented at the Application Site during the Remedial Phase. It is considered that the potential for health and safety incidents at the Application Site will be unlikely due to the limited amount of activity involved during rehabilitation works during the Remedial Phase. There will be limited machinery on site to undertake rehabilitation works, which minimises the risk of the occurrence of health and safety incidents further.

Mitigation Measures

Control measures undertaken during the Peat Extraction Phase (as outlined in Section 5.6.2.3.4) and detailed in Appendix 5-2 Bord na Móna Health and Safety Statement are still in operation at the site.

Residual Effect

Bog rehabilitation during the Remedial Phase will result in a long term, imperceptible, negative residual effect on health and safety.

Significance of Effects

Based on the assessment above, there will be no significant direct or indirect effects on health and safety during the Remedial Phase.

5.6.4.3.5 *Vulnerability to Natural Disasters*

Identification and Description of Impact

The risk of peat failure at the Application Site remains very low during the Remedial Phase. The potential for bog fires which may be caused by rehabilitation works during the Remedial Phase is very low. Given the limited ground disturbance and limited use of machinery during the Remedial Phase, landslides and flooding are not foreseen at the Application Site.

For full details on the vulnerability of the Application Site during the Remedial Phase to major accidents and natural disasters, please see Chapter 15 of this rEIAR.

Mitigation Measures

Mitigation measures listed in Appendix 5-2 Bord na Mona Health and Safety Statement will be implemented during the Remedial Phase.

Residual Effect

The low potential for natural disasters combined with the low levels of activities proposed in for the Remedial Phase are considered to have a long-term imperceptible negative residual effect on health and safety.

Significance of Effects

Based on the assessment above, there will be no significant direct or indirect effects on the vulnerability of the Project to natural disasters during the Remedial Phase.

5.7 Cumulative and In-Combination Effects

5.7.1 Peat Extraction Phase: July 1988 - June 2020

The potential cumulative and in-combination effects of the peat extraction activities and all ancillary works at the Application Site with other relevant activities/projects from 1988 to 2020 are considered below. Further information on activities or developments as part of the cumulative assessment are given in Chapter 2: Background.

Employment, Population levels, Housing and Services

It has been established that the Applicant was one of the State's largest commercial employers in 1988 providing permanent and consistent employment in the peat extraction industry. Other projects and activities as described in the cumulative assessment in Chapter 2 of this rEIAR would also have had the potential to provide employment from 1988 to 2020; however, there were no other largescale commercial employers in the surrounding landscape for this period. The development of the peat extraction industry at the Application Site historically attracted settlers to the area. The onset of industrial activities at the Application Site facilitated the development and expansion of services and amenities in the area as well as the increase in residential dwellings. The Applicant also provided housing for employees. Other projects and activities as described in the cumulative assessment in Chapter 2 of this rEIAR would also have had the potential to attracted further settlers, services and amenities to the local area. Therefore, it is considered there was a slight positive cumulative and in combination effect on employment, population levels, housing and services particularly in the 1980s and 1990s. In more recent years as the peat extraction industry became more mechanised, employment levels at the Application Site decreased. However, redeployment to other sectors and retraining was common at Bord na Móna. Therefore, the cumulative and in combination effect on the employment in the area, is considered to have had a slight negative effect in comparison to the 1980s and 1990s due to the lower number of employees at the Application Site prior to the complete cessation of activities.

The period of peat extraction activities which took place at the Application Site before 1988 are also considered as part of the cumulative assessment. During this period, peat extraction commenced and employment numbers (and corresponding population levels, housing and services) in the area rose as the level of peat extraction increased. The annual average volume of peat extracted during the 1954 to 1988 period was 46,843 tonnes. This level of annual average peat extraction is lower than the 1988 to 2020 period, for which the average annual peat extraction volume is 73,972. It is assumed that the level and efficiency of mechanisation was lower in period of peat extraction activities before 1988 when compared to the Peat Extraction Phase. The Peat Extraction Phase is temporally distinct from the peat extraction that occurred before 1988. As such there is no potential for a significant negative cumulative impact between these periods. No significant cumulative or in combination effects on population levels, housing or services occurred.

Human Health

The assessment above indicates there were no significant cumulative effects on human health arising due to peat extraction activities and all ancillary works. It is considered that in combination with peat extraction during the period before 1988 and small-scale projects as listed in Chapter 2, no cumulative or in-combination impacts on human health occurred.

Cumulative and in-combination effects on human health are discussed in further detail in the relevant chapters: Chapter 7 Land Soil and Geology, Chapter 8 Hydrology and Hydrogeology, Chapter 9 Air Quality, Chapter 10 Climate, Chapter 11 Noise and Vibration, Chapter 12 Landscape and Visual, Chapter 13 Cultural Heritage, Chapter 14 Material Assets (including Traffic and Transport), and Chapter 15 Vulnerability to Major Accidents and Natural Disasters.

5.7.2 Current Phase (June 2020 – Present Day)

The potential cumulative and in-combination effects with other relevant activities/projects with Current Phase activities at the Application Site are considered below. Further information on activities or developments as part of the in-combination assessment are given in Chapter 2: Background.

Employment, Population levels and Services

Other projects and activities as described in the cumulative assessment in Chapter 2 of this rEIAR have had the potential to provide employment and attract settlers and services in the area albeit on a smaller scale. The drop in largescale employment at the Application Site in June 2020 would have had a negative effect on employment in the area. However, where possible, the Applicant have retrained and deployed peat extraction employees to other sectors within the company. Therefore, in combination with small-scale private sector employment in the area a slight negative effect on employment levels are considered for the Current Phase. The assessment above indicates there were no significant cumulative or in-combination effect on population, housing and services in the Current Phase therefore no cumulative or in combination effects are considered.

Human Health

The assessment above indicates there are no significant cumulative effects on human health due to activities associated with the Current Phase. Therefore, there will be no cumulative or in-combination impacts on human health when other small-scale projects and activities in the surrounding landscape are considered.

Cumulative and in-combination effects on human health are discussed in more detail in the relevant chapters: Chapter 7 Land Soil and Geology, Chapter 8 Hydrology and Hydrogeology, Chapter 9 Air Quality, Chapter 10 Noise and Vibration, Chapter 12 Landscape and Visual, Chapter 13 Material Assets (including Traffic and Transport) and Chapter 14 Climate.

5.7.3 Remedial Phase

The potential cumulative and in-combination effects of the implementation of the Cutaway Bog and Decommissioning and Rehabilitation Plans and other relevant activities/ projects are considered below. Further information on activities or developments as part of the in-combination assessment are given in Chapter 2: Background.

Employment, Population levels, Housing and Services

There are no significant effects on employment, population levels, housing and services from the Remedial Phase therefore there will be no cumulative or in combination effects when other projects and activities are considered.

Human Health

It is considered that in combination with other small-scale projects as listed in Chapter 2 and the implementation of the Cutaway Bog Decommissioning and Rehabilitation Plans, there will be no cumulative impacts on human health.

Cumulative and in combination effects on human health are discussed in more detail in the relevant chapters: Chapter 7 Land Soil and Geology, Chapter 8 Hydrology and Hydrogeology, Chapter 9 Air Quality, and Climate, Chapter 10 Noise and Vibration, Chapter 12 Landscape and Visual, Chapter 13 Material Assets (including Traffic and Transport), Chapter 14 Climate and Chapter 15 Vulnerability to Major Accidents and Natural Disasters.

5.7.4 Overall Cumulative Impact Assessment

It is intended to utilise the Application Site for both peatland remediation, wind energy infrastructure and to facilitate environmental stabilisation of the bog group and the optimisation of climate action benefits. The proposed Ballivor Wind Farm is assessed in a separate EIAR with a specific suite of control measures so as to avoid any negative impacts on population and human health. The EIAR, which accompanied a planning application for the proposed Ballivor Wind Farm (PA25M.316212), which was submitted to An Bord Pleanála in April 2023, and details issues related to potential impacts during wind farm construction. The application is currently awaiting decision. The EIAR includes an assessment of the implementation of the Cutaway Bog Decommissioning and Rehabilitation Plans in conjunction with the construction, operation and decommissioning of the Ballivor Wind Farm as well as proposed, permitted and operational plans and projects listed in Chapter 2 of its EIAR. The overall permanent footprint of the proposed Ballivor Wind Farm will be less than 1.4% of the total area of the Bog Group, or approx. 1.8% of the Wind Farm Application Site. Therefore, it will not impact or change the overall goals and outcomes of the proposed Cutaway Bog and Decommissioning and Rehabilitation Plans. It is the intention of the Applicant to integrate the peatland remedial measures with the proposed Ballivor Wind Farm. The key objectives of environmental stabilisation and re-wetting of the cutaway areas will occur between and surrounding the proposed wind farm infrastructure. Overall, there are no significant negative cumulative effects when considering past peat extraction activities and all ancillary works and the proposed Ballivor Wind Farm in combination with the proposed Cutaway Bog and Decommissioning and Rehabilitation Plans. Furthermore, cumulative effects when considering the consented Bracklyn Wind Farm (Planning Ref: 311565) and the proposed Knockanarragh Wind Farm located approx. 6km to the north) and any other proposed, permitted or operational plans or projects listed in section 2.6 Chapter 2 of this rEIAR will not occur.

5.8 Conclusion

This chapter of the rEIAR addresses the impacts on population and human health of peat extraction activities and all ancillary works occurring at the Application Site. The assessments in this chapter determined any likely significant effects that occurred on population and human health (or are likely to occur) namely employment, air quality, dust, noxious emissions, water quality, traffic and transport and general health and safety during the Peat Extraction Phase, Current Phase and Remedial Phase. Furthermore, a baseline assessment of population and human health for the year 1988 was carried out supplemented by Central Statistics Office (CSO) data.

The assessment on population considers the current and historical land use of the Application Site, the current activities occurring within and in the vicinity of the Application Site, and their impacts, if any, on local population and employment. The assessment on human health includes literature review of health impact assessment and the EIA process and a review of the past, current and future activities on air quality, dust, noxious emissions, traffic and transport and general health and safety. CSO data has been used to inform the population and human health assessment and identify any impacts that may arise as a result of the Project.

There are no dust, water quality, noxious gas emission data prior to the commencement of the IPC Licence condition compliance requirements in 2000. Since 2000, the Applicant have undertaken annual dust monitoring at the Application Site and there has been only one non-compliance events in relation to dust deposition recorded. The exceedance of the limit value was due to an excavator operating directly adjacent to the dust gauge thereby causing a localised non-compliance event. Furthermore, there have been no third party complaints to excessive dust deposition in the area. Long term monitoring of NO_2, PM_{10} and PM_{25} at nearby monitoring stations or comparative locations indicate there were no exceedances to the daily or annual thresholds of NO_2, PM_{10} and PM_{25} in the atmosphere. Since 2000, the Application Site has been operating under IPC Licence noise limits. There have been no incidents of noise exceedances or noise complaints pertaining to peat extraction activities and all ancillary works at the Application Site since records began.

Peat Extraction Phase (July 1988- June 2020)

The Application Site was subject to ongoing industrial peat extraction activities and all ancillary works from July 1988 to June 2020.

The Applicant has been the leading commercial employer for rural communities of the Midlands of Ireland since the late 1950s, employing thousands of workers permanently throughout the decades, both directly in the peat extraction industry and indirectly, through the horticultural industry. Employment numbers at the Application Site leading up to the permanent cessation of activities were significantly lower than in 1988. Since 2000, continuous environmental monitoring and maintenance has been undertaken as required under the IPC Licence P0501-01 which has contributed to employment levels. The Applicant provided ongoing, albeit limited employment through the extraction of peat until June 2020.

Current Phase (June 2020 – Present)

Peat extraction ceased at the Application Site in June 2020; therefore, no peat extraction works are occurring at the Application Site during the Current Phase. All existing stockpiles of peat were removed off the bogs by the end of 2023. Cutaway Bog Decommissioning and Rehabilitation Plans have been prepared and will be agreed with the EPA before being implemented during the Current Phase.

Where possible, the Applicant has provided retraining to employees at the Application Site and provided employment in other Bord na Móna departments and locations. Additionally, in the planning of the cessation of peat extraction across the Bord na Móna landbank, strategies such as the Brown to Green strategy, which involves the transformation of the Applicant from a traditional peat business into a climate solutions company, were being devised. The Applicant still provides employment at the Application Site through environmental monitoring and maintenance as required under the IPC Licence P0501-01 and through the Peatland Climate Action Scheme (PCAS).

Remedial Phase

The Remedial Phase of the Project involves the implementation of Cutaway Bog Decommissioning and Rehabilitation Plans as per the IPC Licence. The current Cutaway Bog Decommissioning and Rehabilitation Plans are presented in Appendix 4-2. The implementation of the rehabilitation plans will require 3-4 number staff for the first two years followed by 1-2 no. staff visiting monthly over 30 years.