

8

CLIMATE



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8.1 INTRODUCTION

This chapter of the EIAR has been prepared by WSP Ireland Consulting Ltd (WSP) and assesses the potential climatic impacts which can be reasonably expected to occur due activities relating to the continued operation of an existing quarry (Proposed Development) at Philipstown, Redbog and Athgarrett, Co. Kildare (the “Site”).

Potential climate impacts can be generated through the following processes at the Site:

- Impacts of climate change on the development, including the sensitivity, exposure and the overall vulnerability of the development to impacts from relevant climate hazards; and
- Impacts of the development on the climate.

8.1.1 TECHNICAL SCOPE

This assessment has been made with guidance from the ‘Guidelines on the information to be contained in environmental impact assessment reports’, published by the EPA in May 2022. The guidelines were drafted by the EPA with a view to facilitating compliance with EIA Directive (2014/52/EU).

8.1.2 GEOGRAPHICAL AND TEMPORAL SCOPE

The assessment directly covers the physical extent of the EIA site boundary for the Site as shown in Figure 8-1. In the context of the EIAR, the EIA boundary contains lands which form the existing quarry site and some areas which extend beyond the working areas. The EIA boundary encompasses the Section 37L (the Planning Application) boundary, which is shown on the drawing set which accompanies the planning application.

The temporal scope of this assessment covers the current quarrying activities on the Site and the extension of these permitted activities into the future, with the Section 37L application boundary. Given the phased nature of the extractive industry and the similarities between the construction and operational phases of the Proposed Development, these will be considered together in this chapter as the overall operational phase.

Under the current programme of the Proposed Development, the extraction phase will last for 13 - 15 years, which will provide for fluctuations in market demands for the aggregate extracted from the Site. The duration of the extraction phase is therefore classified as ‘medium-term’ by the EPA’s 2022 ‘Guidelines on the information to be contained in environmental impact assessment reports’.

The restoration phase of the Proposed Development will follow the extraction phase and will be 2 - 3 years in duration, which is ‘short-term’ - those lasting from one to seven years (EPA, 2022).

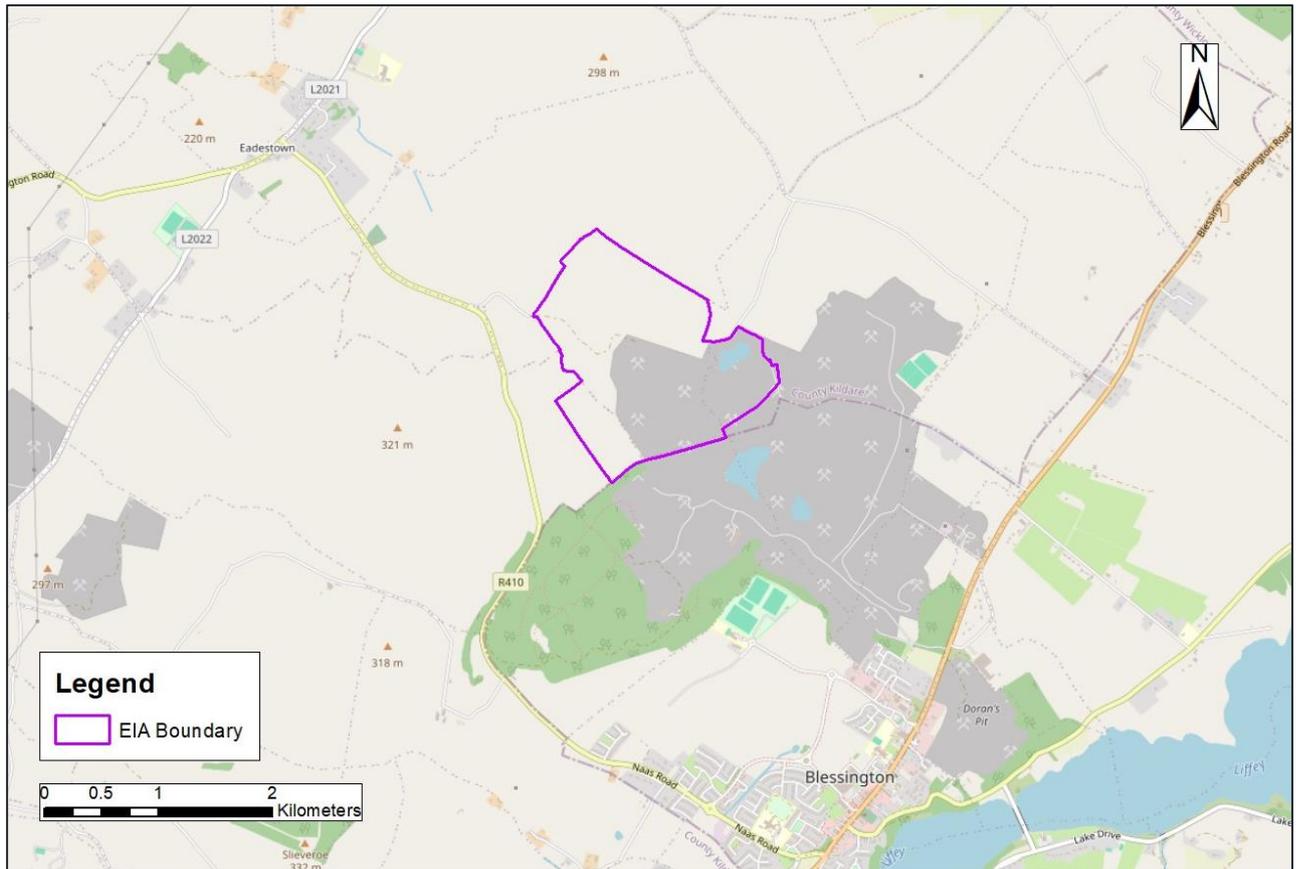


Figure 8-1 - Site location

8.2 LEGISLATIVE AND POLICY CONTEXT

8.2.1 LEGISLATION

Legislative references considered specifically for the assessment of climate from quarrying activities, and relevant statutory instruments in a planning context include:

- Directive 2014/52/EU of the European Parliament and of the Council, (amending Directive 2011/92/EU);
- European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018, S.I. 296 of 2018; and
- Planning and Development Regulations 2001 (as amended).

Relevant statutory instruments in the context of quarrying include:

- Mines and Quarry Act 1965, 7 of 1965

8.2.2 RELEVANT POLICIES AND PLAN

National

The Climate Action Plan 2023 aims to transition to a decarbonised economy and achieve net zero greenhouse gas emissions by 2050. This Plan targets key economic and strategic areas and identifies actions required to enable the State to meet the 2050 targets. The plan outlines the current



state of play across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and charts a course towards the decarbonisation targets.

Climate change is a threat for humanity and requires a comprehensive international response to address the impacts. Mitigation will be a major challenge to our society and the Climate Action Plan identifies the central priority that climate change will have in the political and administrative systems in our country in the future.

The plan acknowledges concern that recent growth in emissions, particularly from Industry, Agriculture, and Transport put the State on a trajectory to be over 25% off target for the next 2021-2030 accounting period. This emissions growth is driven entirely by increasing economic activity and demonstrates how highly correlated industry emissions still are with economic activity.

A detailed agenda of transition and change in these industries is required to ensure that the sectors are climate resilient and can remain competitive in a decarbonising world. Such an agenda will include:

- Improving energy efficiency of processes, buildings and transport;
- Replacing fossil fuel with renewables in their processes, buildings and transport;
- Improving the way in which resources are used in their supply chain to reduce emissions and conform to circular economy principles;
- Being innovative across production, distribution, and marketing to realise the opportunities arising
- Developing the new skills and techniques necessary; and
- Developing measures of the climate and environmental impact of activities which will become more widely expected in the marketplace.

County Kildare

The Site is within the administrative boundary of Kildare County Council (KCC). The Kildare County Development Plan 2023-2029 (KCDP) acknowledges that mineral reserves are generally located within the rural area, and that the nature of the extractive industry is such that the industry must be developed where those resources occur.

The Plan also recognises that the industry can have damaging environmental effects and states that permission will only be granted where KCC is satisfied that residential and natural amenities will be protected, pollution will be prevented, and aquifers and groundwater safeguarded.

To ensure this, KCC notes that planning applications must account for potential environmental impacts as stated in their Mineral Resources & Extraction Industry Policy, as follows:

- **RD P8:** Support and manage the appropriate future development of Kildare's natural aggregate resources in appropriate locations to ensure adequate supplies are available to meet the future needs of the county and the region in line with the principles of sustainable development and environmental management and to require operators to appropriately manage extraction sites when extraction has ceased.

To support the KCDP, KCC has adopted the following objective in relation to climate within the extractive industry:

- **RD 048:** Manage the finite aggregate resources being mined by the extractive industries in the county to supply the future needs of our region while working to reach our climate change targets.



KCC has adopted policies in the KCDP in relation to the protection of climate.

KCC objectives which are relevant to the climate assessment include:

- **CS 02:** Ensure that the future growth and spatial development of County Kildare provides for a county that is resilient to climate change, enables the decarbonisation of the county's economy and reduces the county's carbon footprint in support of national targets for climate mitigation and adaptation objectives as well as targets for greenhouse gas emissions reductions.
- **CS 08:** Support the implementation of Kildare's Climate Change Adaptation Plan in conjunction with relevant stakeholders.

8.2.3 RELEVANT GUIDANCE

This assessment has been made with guidance from the 'Guidelines on the information to be contained in environmental impact assessment reports', published by the EPA in May 2022.

Other guidance documents considered in this assessment include:

- Kildare County Council; Climate Change Adaptation Strategy, 2019 - 2024
- Climate Action Plan, 2023
- European Commission; Climate Change and Major Projects, 2016
- IEMA; Assessing Greenhouse Gas Emissions and Evaluating their Significance, 2017

8.3 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

8.3.1 ASSESSMENT AIMS

As identified above, the key objectives of this assessment are to assess:

- Impacts of climate change on the development, including the sensitivity, exposure and the overall vulnerability of the development to impacts from relevant climate hazards; and
- Impacts of the development on the climate.

The assessment of the development's vulnerability to climate change shall review published historical regional weather data to demonstrate the current climate impacts in the study area, and will also consider any relevant events reported by site personnel.

Impacts of the development on climate will consider GHG emissions calculation for the project life cycle and other aspects of the development design that may impact emissions.

8.4 CHARACTERISTICS OF THE DEVELOPMENT

The EIAR has been prepared to accompany a Section 37L for the continuation and extension of quarrying activities at the Site. The lands the subject of this EIAR (EIA boundary) extend to 95.8 ha. The area that makes up the Section 37L application planning unit extends to approximately 64.0 ha.

A continuation of activities at the Site are proposed with two lateral extensions, to the south and to the north. Proposed activities will involve the extraction of both rock (greywacke) and sand and gravel using excavation techniques, which include blasting for rock extraction in the south of the site. The extraction activities are proposed to be continued above the water table with dry quarrying of the sands and gravels and rock. This application for further development of the quarry is made concurrent with an application for substitute consent for the quarry that is accompanied by an rEIAR.

The lands surrounding the Site can be characterised as rural in nature, with land uses in the area being agricultural, industrial and single-house residential. The lands contiguous to the boundaries of the Site are in agricultural use to the north and west. To the south and east lands adjacent to the Site are aggregate extractive industry. There are scattered residential properties in the vicinity of the Site, primarily concentrated to the north of the site along the Local Road L6038-1, and to the west of the Site along the R410 and unnamed local roads.

8.5 POTENTIAL EFFECTS

8.5.1 CLIMATE CHANGE IMPACTS ON THE PROPOSED DEVELOPMENT

To assess the potential effects of climate change on the development the approach identified in European Commissions (2016) 'Climate Change and Major Projects' assessment guidance has been considered. Although the development is not a 'major project', this method is considered suitable guidance for such a climate change impact assessment. In designing and planning of such projects the guidance seeks to consider both climate change adaption and mitigation measures. Adapting a project is to ensure adequate resilience is built into the design to cope with relevant climate change impacts, e.g. flooding.

The assessment of project adaptations required first must assess the vulnerability of the Site and also the risk of impacts from relevant climate hazards.

The sensitivity, exposure and the overall vulnerability of the development over the lifetime of the extraction has been assessed below according to the most applicable climate variable and hazards. Climate change factors such as ocean acidification, sea-level rise and storm surges and waves have been scoped out of this climate assessment. For the development the most applicable climate variables and hazards to consider are:

- Increasing precipitation affecting groundwater levels;
- Fluvial flooding;
- The effects of colder weather extremes effecting site operations; and
- Potential drought conditions from prolonged heat.

The sensitivity of various aspects of the Proposed Development have been assessed in Table 8-1 with regards to the relevant climate hazards identified. On-site assets include any structures and accessible aggregate within the Proposed Development footprint. Inputs to the Site include the raw materials required for Site function, i.e. water and imported fuels. The quarry site's outputs are the extracted aggregate and transport linkages, including access to and from the site to the local road network.

Incidents of increased groundwater levels and fluvial flooding in the region coincide with periods of higher precipitation. The average annual rainfall recorded at Casement Aerodrome from 1964 to 2023 has been shown in Figure 8-2.

A river-network surface water feature is identified on the EPA Envision Mapviewer (Deerpark 09) ca. 700 m to the south the Site and flows to the southeast to the Poulaphouca Reservoir (Blessington lake). An unnamed river network feature (IE_EA_09L010400) flows ca. 400 m west of the proposed extension area and also joins the 'Deerpark 09' feature before it flows to the Poulaphouca Reservoir. As the Site is located far up gradient from these surface water features it is not anticipated to be at risk of fluvial flooding and surface water run-off will not flow from the site due to the inwards sloping nature of the floor and faces of the extraction area.

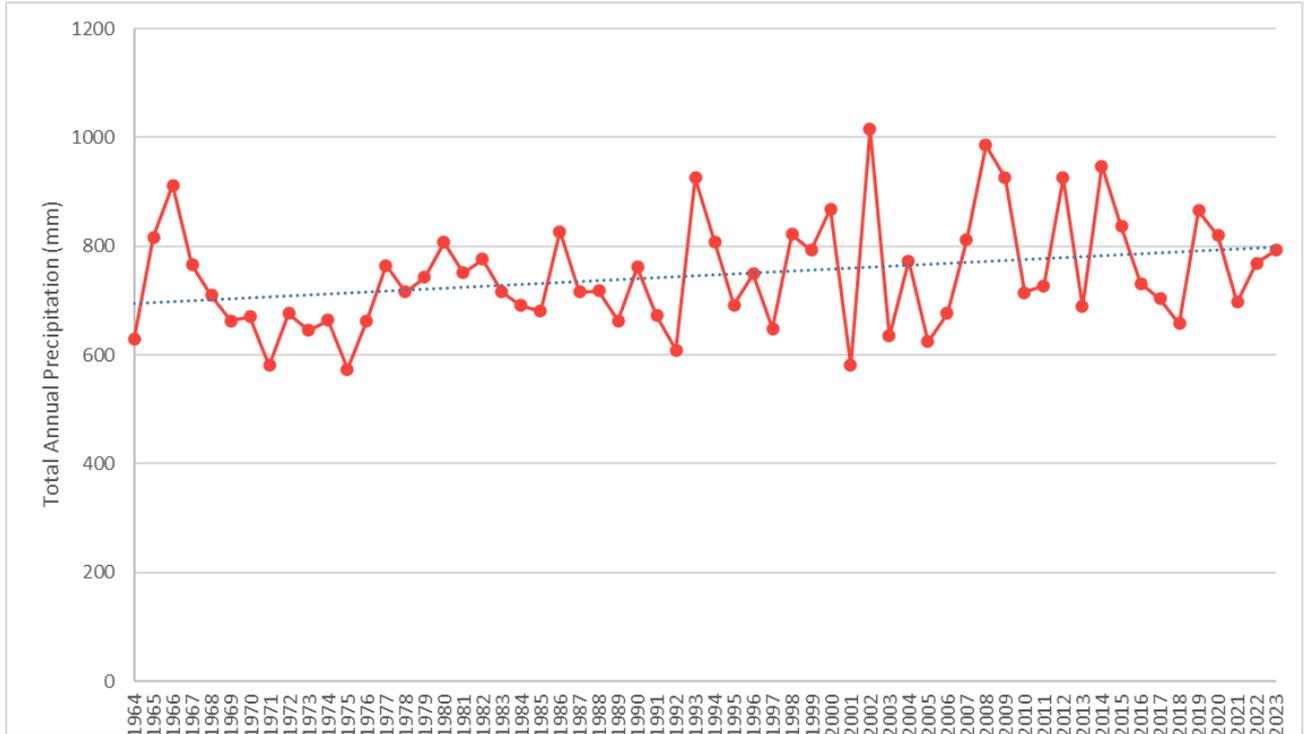


Figure 8-2 - Average annual precipitation recorded at the Met Eireann Casement station from 1964-2023

Table 8-1 -: Sensitivity of the development to relevant climate hazards.

Sensitivity	Climate Variables			
	Fluvial Flooding	Precipitation and Groundwater Levels	Colder Weather Extremes	Heat/Drought
On-site assets	Low	Medium	Low	Low
Inputs to site (water, fuels, etc.)	Low	Medium	Low	Medium (water)
Outputs (greywacke, treated mine water)	Low	Low	Low	Medium
Transportation Linkage	Low	Low	Medium	Low
Highest Sensitivity Score	Low	Medium	Medium	Medium

Table 8-2 presents an assessment of the development in relation to the current climate and future predicted climate changes. Future impacts have been assessed as low given the medium term duration of the assessment period (13-15 years)_in addition to the mitigations which have been built into the Project at this stage.



Table 8-2 :- Exposure of the development to future climate change

Exposure	Climatic Variables			
	Fluvial Flooding	Precipitation and Groundwater Levels	Colder Weather Extremes	Heat/Drought
Current Climate	Low	Low	Low	Low
Future Climate	Low	Low	Low	Low
Highest Score	Low	Low	Low	Low

The combination of the Site’s ‘Sensitivity’ and ‘Exposures’ have shown, overall, that the Site is at a Low risk from climate hazards (Table 8-3), which is considered to be ‘not significant’. Further adaptations have been inbuilt into the Site as the area of extraction is the most exposed to potential climate impacts. Good site management in terms of groundwater monitoring and the good management of site excavations and run-off management during very extreme rainfall or flooding events have been incorporated into the design and operation of the quarry site. Following the implementation of these mitigation measures the overall impact from climate hazards at the site is considered to be ‘imperceptible’.

Table 8-3 - Overall vulnerability of the development to relevant climate change events.

Vulnerability		Exposure (Current & Future Climate)		
		Low	Medium	High
Sensitivity	Low	Fluvial Flooding		
	Medium	Precipitation & Groundwater Levels Colder Weather Extremes Heat/Drought		
	High			

8.5.2 IMPACTS ON CLIMATE FROM THE DEVELOPMENT

The Proposed Development is not considered to be of a sufficient scale to have a potential to impact the regional or local climate in any significant manner. In addition, the operation of plant and traffic movements at the Site are estimated to generated approximately 50 kt CO₂e per annum.

The continued operation of the Proposed Development is not anticipated to have significant effects on local prevailing weather conditions, nor it is anticipated to increase potential of flooding in the surrounding area.

Carbon release from the progressive stripping of soil and overburden will be minimal, however it's contribution to carbon emissions is noted. It is estimated that total of ca. 31.4 ha. of additional land will be disturbed with soil stripping in the course of this Proposed Development (combination of lateral void and formation of screening bunds). These operations will have the potential to result in a loss of soil organic carbon in form of CO₂. However, given the small area of stripping the liberation of soil organic carbon and impact on the climate is considered to be 'imperceptible' adverse.

Overburden will be stockpiled on the quarry site within the screening berms, in order to preserve topsoil quality and integrity. Coupled with the ecological screening areas set aside, the perimeter berms will ensure that the carbon loss through soil stripping is neutral. During restoration these soils will be redistributed across the site. This restoration regime at the Site and the is considered to have positive 'imperceptible' impacts on the climate during and post development.

Therefore, the impacts on climate and climate change are considered to be Not Significant.

8.5.3 THE HUDSON BROTHERS LTD ENVIRONMENT POLICY

HBL has committed to achieving and maintaining industry leading environmental standards and consider environmental management to be a priority. HBL has aimed for continuous improvement with regard minimising the environmental impact of their activities, conserving mineral and energy resources, reducing their visual impacts and minimising waste generation. They seek to exists as a good neighbour and have an open communication policy on environmental performance.

8.6 MITIGATION

Emissions from vehicles during the extraction and restoration phases of quarrying activities can add to the receiving air environment. With regards to climate impacts, it is anticipated that CO₂ will be emitted from vehicle exhausts during the construction, operational and restoration phases of existing and proposed development. As CO₂ is a key gas linked to climate change, the following mitigation measures will be put in place to limit vehicle and plant emissions from the mining activities:

- No vehicles or plant will be left idling unnecessarily;
- Vehicles and plant will be well maintained. Should any emissions of dark smoke occur (except during start up) then the relevant machinery will be stopped immediately, and any problem rectified before being used;
- Engines and exhaust systems will be regularly serviced according to the manufacturer's recommendations and maintained to meet statutory limits/opacity tests; Full loads used in road haulage in order to minimise the carbon footprint per load of exported materials;
- Site management will continue to explore energy efficiencies and incentives in the Site's electrical infrastructure and management practices to optimising energy consumption and GHG reduction in its operations. The energy reduction and efficient use will be promoted in areas of the Site including efficient site lighting using LED lighting.
- Undertake soils stripping during wetter periods (in as far as reasonably practical) to ensure carbon losses are reduced compared with warmer drier periods; and
- Minimising the double handling of materials.

Table 8-4**Error! Reference source not found.** presents an assessment of the potential impacts from the proposed development both with and without the establishment of appropriate mitigation measures. It is considered that the impact from vehicle emissions will have an imperceptible effect in the medium term whilst mining activities are taking place. An 'imperceptible effect' is defined by



the EPA in their 2022 ‘Guidelines on the information to be contained in environmental impact assessment reports’ as ‘An effects capable of measurement but without noticeable consequences’.

As noted above, upon completion the site will undergo planting of native tree and shrubs and indigenous plant species encouraged to re-colonize worked out areas. Restoration plans include the formation of a water body, providing an environment for increased biodiversity. Following the restoration and the establishment of agricultural land and the maturity of the planted areas of the site, there will be a permanent effect (>60 years) of carbon sequestration, resulting in a positive effect on the microclimate.

Table 8-4 - Assessment of Impacts to Climate and Mitigation Measures employed.

Impact	With / Without the establishment of Mitigation Measures	Type of Effect	Quality of Effects	Significance of Effects	Duration of Effects
Climate Hazards	Without	Direct	Negative	Not Significant	M-T
Climate Hazards	With	Direct	Negative	Imperceptible	M-T
GHG emissions from extraction activities – Plant and vehicles	Without	Direct	Negative	Not Significant	M-T
GHG emissions from extraction activities – Plant and vehicles	With	Direct	Negative	Not Significant	M-T
Carbon release from soil stripping	Without	Direct	Negative	Imperceptible	S-M
Carbon release from soil stripping	With	Direct	Negative	Imperceptible	P

Notes:

- Type of Effect – Direct and Indirect
- Quality of Effects – Positive; Neutral and Negative
- Significance of Effects – Imperceptible; Not significant; Slight Effects; Moderate Effects; Significant Effects; Very Significant; and Profound Effects;
- Duration of Effects – Momentary Effects (Seconds to minutes); Brief Effects (Less than a day); Temporary Effects (Less than a year); Short-term Effects (1 to 7 years); Medium-term Effects (7 to 15 years); Long-term Effects (15 to 60 years); and Permanent Effects (Lasting over 60 years)

8.7 RESIDUAL EFFECTS

Residual impacts of the proposed extraction activities on air quality, microclimate and climate change are considered to be imperceptible. In the longer term, on completion of the quarry site restoration, there will be a permanent effect (>60 years) of carbon sequestration, resulting in a positive effect on the microclimate. This will most likely constitute a minor positive impact for the local environment.



8.8 CUMULATIVE EFFECTS

There is potential for cumulative impacts on the climate and from climate hazards between the proposed development and the adjacent existing quarries to the south and east. However, these impacts are considered to be negligible in view of the scale of operations, predominantly rural nature of other surrounding land, and local topography.

8.9 DIFFICULTIES ENCOUNTERED

No particular difficulties were encountered in the preparation of this chapter of the EIAR.

8.10 SUMMARY AND CONCLUSIONS

This assessment considers the potential impacts and effects of the Proposed Development on the surrounding climate.

The main receptors that could be affected by changing climate due to activities at the Site were identified and potential effects were assessed.

The assessment concludes that the Proposed Development is not considered to be of a sufficient scale to have a potential to impact the regional or local climate in any significant manner.

Furthermore, the assessment of the combination of the Site's 'Sensitivity' and 'Exposures' have shown, overall, that the Site is at a Low risk from climate hazards, which is considered to be 'not significant'. Further adaptations have been inbuilt into the Site as the area of extraction is the most exposed to potential climate impacts. Good site management in terms of groundwater monitoring and the good management of site excavations and run-off management during very extreme rainfall or flooding events have been incorporated into the design and operation of the quarry site. Following the implementation of these mitigation measures the overall impact from climate hazards at the site is considered to be 'imperceptible'.



8.11 REFERENCES

Department of the Environment, Climate and Communications. 2022. *Climate Action Plan 2023*.

European Commission. 2016. *Climate Change and Major Projects*

EPA. 2022. *Guidelines on the information to be contained in Environmental Impact Assessment Reports*.

IEMA. 2017. *Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance*.

Kildare County Council (2023) *Kildare County Development Plan 2023-2029*.