

8 CLIMATE

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 (the 'Proposed Development') at Hempstown Commons, 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.

The following assessment was prepared by Lisa Cleary (B.A. (mod), GradIEMA) and Rhian Llewellyn (MGeol, PhD, PIEMA). Lisa is an environmental scientist with over 1 years' experience, and Rhian is a geologist and EIA specialist with over 9 years' experience.

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, within 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 12 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 years in duration, which is 'short-term' - those lasting from one to seven years (EPA, 2022).



Figure 8-1 - EIA Boundary shown on October 2024 aerial.

8.1.3 PROJECT DESCRIPTION SUMMARY

A full description of the proposed development is provided in Chapter 2 (Project Description) of this EIAR. A high-level summary of the proposed development is provided below.

The proposed development for further extraction of rock is to be within the existing void area with lateral extension of the void proposed in a north-easterly direction. The estimated total quantity of aggregate resource to be extracted in the life-of-quarry is c. 1,757,500 tonnes. A proposed 12 year life-of-quarry requirement is based on an average production rate of ca. 2,929 tonnes per week for rock. Dry processing of mechanically broken and blast rock onsite will comprise crushing and screening to produce aggregate materials for market.

SQL proposed to relocate the existing office container, wheel wash and water recycling tank, weighbridge to fully within the Application Site to provide space for realignment of the private access lane on SQL lands and to develop dedicated carparking facilities for the quarry operation on SQL owned lands.

The proposed car parking facilities will provide parking for HGVs and private vehicles, including guest parking.

SQL propose to decommission the existing abstraction borehole located off the access road to facilitate the road realignment on their own lands. SQL propose to undertake periodic extraction of groundwater from an abstraction borehole located on Stresslite Precast Ltd to provide water for SQL's closed-loop system wheelwash recycling tank and the mobile bowser.

There will be no direct discharge to surface or groundwater from the quarry operations. Collected waters from the base of the quarry void will continue to be pumped to the primary soakaway (which is connected to an overflow soakaway). It is proposed that the collect waters will pass through a bypass separator prior to discharge to the primary soakaway. It is proposed to extend the existing sump on the quarry floor to provide additional temporary holding capacity for collected waters, if required.

Following end-of-quarry life, a 2 year restoration period is proposed. This is detailed in a Restoration and Habitats Management Plan provided in appendix 2B of Chapter 2 (Project Description) of this EIAR.

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 PLANS

National

The 2024 Irish Climate Action Plan (CAP24) is a comprehensive roadmap designed to guide Ireland towards achieving its climate goals. This plan is the third annual update since the introduction of the Climate Action and Low Carbon Development (Amendment) Act 2021, which legally binds Ireland to reduce its greenhouse gas emissions by 51% by 2030 and to reach net-zero emissions by 2050.

Key Objectives and Strategies:

- Emission Reductions: CAP24 outlines specific measures to halve Ireland's emissions by 2030. This includes sectoral emissions ceilings for key sectors such as electricity, industry, built environment, transport, and agriculture;
- Carbon Budgets: The plan aligns with the economy-wide carbon budgets and sectoral emissions ceilings agreed upon by the government in 2022. These budgets set limits on the total amount of greenhouse gases that can be emitted during a specific period; and
- High-Impact Actions: A new approach to the Annex of Actions has been implemented, focusing on high-impact actions that are crucial for meeting climate targets. This ensures that the most effective measures are prioritized.

Sector-Specific Measures:

- Electricity: Transitioning to renewable energy sources and enhancing grid infrastructure to support increased renewable capacity;

- Transport: Promoting electric vehicles, improving public transport, and encouraging active travel like cycling and walking;
- Built Environment: Enhancing energy efficiency in buildings through retrofitting and adopting sustainable construction practices; and
- Agriculture: Implementing sustainable farming practices and reducing methane emissions from livestock.

The plan emphasizes the importance of governance and accountability, with a framework for ministerial accountability and oversight of government actions. It also highlights the need for public engagement and a just transition, ensuring that the shift to a low-carbon economy is fair and inclusive.

County Kildare

The Kildare County Development Plan 2023-2029 was adopted on 9th December 2022. The key policies and objectives of this current plan are listed in Section 2.7.6 of the Project Description (Chapter 2).

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

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 for the project life cycle and other aspects of the development design that may impact emissions.

8.4 BASELINE CONDITIONS

8.4.1 EXISTING ENVIRONMENT

The existing operational quarry has been in use since the mid 1940's and has been registered under Section 261, Planning & Development Act 2000 (Quarry Ref. No. QR 39) and subsequent planning permission for continuance of use for quarrying activities was granted under PPR No. 07/443 ABP ref PL09253383. The Site comprises land currently used for quarrying activities.

The lands surrounding the Site can be characterised as rural in nature, with land uses in the area being agricultural and single-house residential. Quarrying and aggregate extraction are practiced in the adjacent lands to the north of the Site and more widely to lands further to the southwest. The quarries located in the Blessington area are a major source of aggregate used in the production of construction material in the Greater Dublin region. The boundaries of the land comprise hedgerows and areas of scrub. There are other commercial sites operating in the vicinity of the Site, with a precast concrete company and a sand and gravel quarry operating directly adjacent to the Site. There are also scattered residential properties in the vicinity of the Site, primarily along the Local Road L6030.

8.4.2 CLIMATE AT THE SITE

The Irish climate is subject to strong maritime influences, such as the Atlantic Ocean and the warm North Atlantic Drift, with the effects decreasing with increasing distance from the Atlantic coast. The climate in the area of the Site is typical of the Irish climate, which is temperate maritime. The closest Met Éireann station is located at Casement Aerodrome approximately 11 km to the north of the Site. The total rainfall for the area recorded in 2024 was 904.5 mm.

8.5 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 extend to 10.03 ha. and are located within the EIA project boundary for the EIAR (18.45 ha).

A continuation of activities at the Site are proposed with a lateral extension to the northeast. Proposed activities will involve the extraction of the rock (greywacke) using excavation techniques, which include drilling and blasting, and rock-breaking.

SQL propose to relocate the existing office container, wheel wash and tank, weighbridge within the Site to provide space for realignment of the private access lane on SQL lands and to develop dedicated carparking facilities for the quarry operation on SQL owned lands. SQL propose to decommission the existing abstraction borehole located off the access road to facilitate a road realignment on their own lands. SQL propose to undertake periodic extraction of groundwater from an abstraction borehole located on Stresslite Precast Ltd to provide water for SQL's closed-loop system wheelwash recycling tank and the mobile bowser.

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 east and west. To the north, lands adjacent to the Site are used for the aggregate extractive industry. To the south, lands are in use by a precast concrete manufacturing company (Stresslite Precast Ltd.) There are scattered residential properties in the vicinity of the Site, primarily concentrated to the south of the site along the Local Road L6030.

8.6 POTENTIAL EFFECTS

8.6.1 CLIMATE CHANGE IMPACTS ON THE 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 Proposed 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 adaptation 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 Proposed 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 Proposed 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 Site 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 (IE_EA_09R020300) ca. 650 m to the northwest of the Site and flows to the north to the River Liffey. The Hempstown Stream (IE_EA_09G090950) flows 1.4 km to the southeast of the Development area 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.

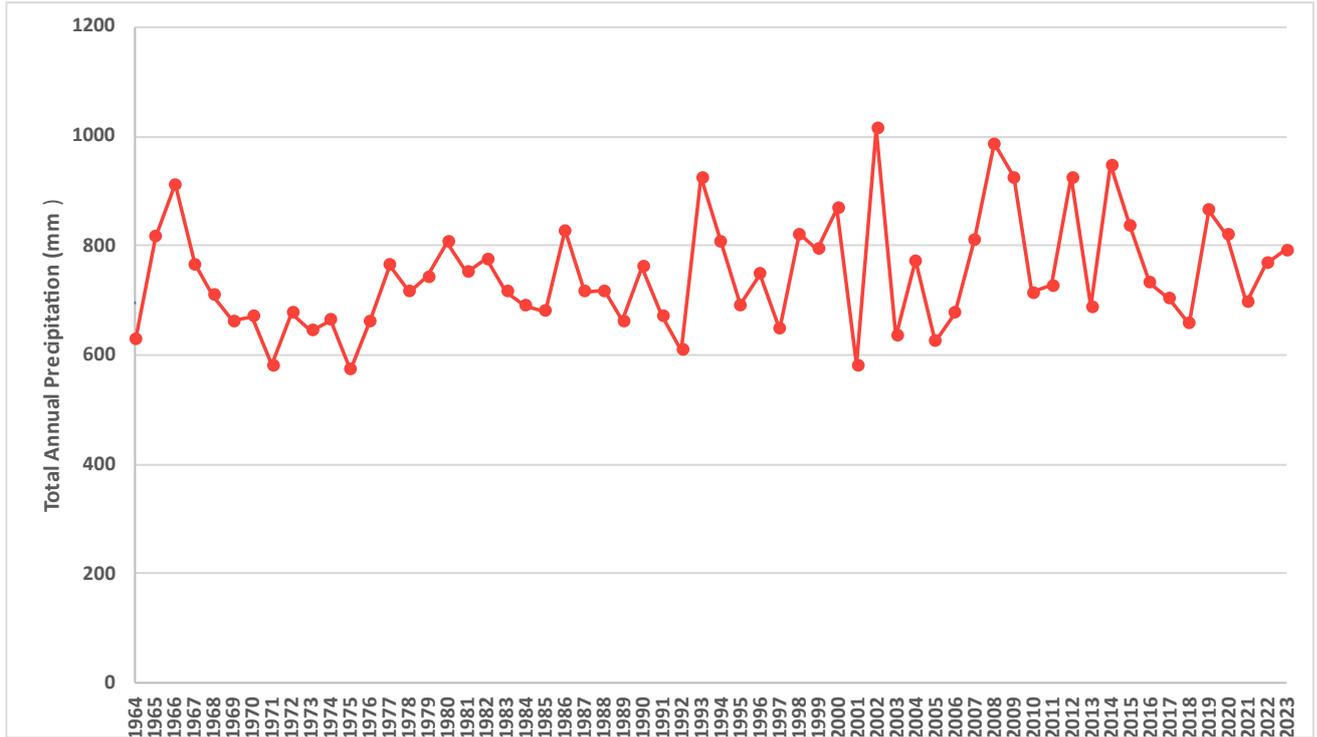


Figure 8-2 - Annual precipitation recorded at Met Eireann Casement station from 1964-2023.

Table 8-1 - Sensitivity of the development to 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 (rock, 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 (12 years) in addition to the mitigations which have been built into the Proposed Development 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
Climate Events during the assessment period	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			

8.6.2 IMPACTS ON CLIMATE FROM THE PROPOSED 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 have been screened out of the assessment as they are considered to have an insignificant effect on the local air quality (refer to Chapter 7 Air Quality).

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. 1.89 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 in a series of benches along the north-west wall of the existing quarry void. 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**.

8.7 MITIGATION MEASURES

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 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)

8.8 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.

8.9 CUMULATIVE EFFECTS

The cumulative effects associated with other permitted / under construction third-party developments have been considered in Chapter 15 of this EIAR. Cumulative effects are considered to be **Not Significant**.

8.10 DIFFICULTIES ENCOUNTERED

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

8.11 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*'.

8.12 REFERENCES

Department of the Environment, Climate and Communications. 2022. Climate Action Plan 2025.

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.