12.0 INTERACTIONS / INTER-RELATIONSHIPS

12.1 Introduction

This section of the EIAR describes interactions/inter-relationships between various aspects of the environmental impact assessment for the proposed development of a sand and gravel pit (the Application Site). Table 12.1 identifies specific topics within the EIAR where the impacts or environmental effects of the specific topics interact/inter-relate with each other.

Table 12.1: Interactions

	Population & Human Health	Biodiversity	Soils & Geology	Water	Climate	Air	Noise	Landscape	Archae-ology & Cultural Heritage	Material Assets
Population & Human Health										
Biodiversity										
Soils & Geology										
Water		x	x							
Climate	x									
Air	x	x								
Noise	x	x								
Landscape	x		x							
Archaeology & Cultural Heritage	x									
Material Assets	x		x	x				x	x	

12.2 Population & Human Health and Air

Restoration activities using soil and stone can generate elevated dust levels, particularly during long spells of dry weather or periods of windy weather. Chapter 7.0 of the EIAR (Air Quality Chapter) shows that baseline dust deposition rates recorded at the Site were below the guideline level of 350 mg/m^2/day. The overall impact from the proposed restoration activities, in terms of dust emissions is expected to be not significant to imperceptible to the air environment once the mitigation measures outlined in Section 7.7 and Section 7.7.1 are implemented.

12.3 Population & Human Health and Climate

Ireland's greenhouse gas emissions per person are amongst the highest on the planet and fourth highest of the EU 28 countries. GHCL strive for compliance with all relevant legislation, prevention of pollution and continuous improvement in all areas of environmental management in their operations. Through the restoration of the Site and the establishment of agricultural lands and the planted areas reaching maturity, it is expected that there will be a permanent positive effect (>60 years) of carbon sequestration at the Site, resulting in a positive effect on the microclimate.

12.4 Population & Human Health and Noise

Noise will be generated from the proposed restoration activities at the Application Site. To assess baseline levels, noise monitoring data from the Site was reviewed. At present the noise environment at the Application Site is indicative of a rural setting with slight influences of local industry noted. Through the implementation of the mitigation measures detailed in Section 8.5, it is considered that the restoration activities will have no significant impacts at nearby sensitive receptors and will have imperceptible residual impacts.

12.5 Population & Human Health and Landscape

In terms of visual impacts, six viewpoints were selected within the study area to represent a range of viewing distances, angles and receptor types. The primary means of mitigation for this project is the progressive restoration of the quarry as phased works are completed, in order to achieve a restoration of the Application Site that is in keeping with the surrounding landscape. Visual impacts at the six viewpoints were assessed during the various excavation phases of the proposed development.

Only during the restoration phase is there considered to be any discernible landscape and visual impacts and these will principally relate to on-site infilling activates from earth moving machinery and from HGV movements to and from the site. Such effects are 'temporary' or 'short term' in duration and of a Low magnitude. Consequently the significance of restoration phase landscape and visual effects is considered to be **Slight-imperceptible** in this robust landscape context.

Visual impacts have been assessed from 6 no. representative viewpoints using photomontages that depict the end use, grassed mound. In all instances, the effect on infilling and restoring the existing quarry to agricultural grassland is deeded to result in an **Imperceptible / Positive** significance of impact.

12.6 Population & Human Health and Archaeology & Cultural Heritage

Archaeological artefacts are part of our national heritage. Due to the presence of the Ballinderry Burial ground (SMR KD003-034----) within the south of Site and other archaeological sites within the vicinity of the Site it is possible that previously non-detected sub-surface archaeological remains may exist. However, the assessment of the Application Site, using documentary, cartographic and aerial photographic sources as well as a field survey, indicate that the proposed development will have no direct or indirect impact on any known items of archaeology, cultural heritage or buildings of heritage interest in the application area or the vicinity. Furthermore, the Ballinderry Burial ground has been persevered *in situ* at the Site during previous extraction activities and it will not be impacted by the proposed restoration works.

12.7 Population & Human Health and Material Assets

Junction capacity analysis at existing junctions was undertaken with, and without, the proposed development traffic and indicates that the junctions will continue to operate within capacity for each of the assessment years 2019, 2024 and 2034. It is expected that there will be a minor impact on traffic flows on the existing road network with an increase of 7.08 – 8.66% of total traffic on the L1002 between 2018 and 2034.

12.8 Biodiversity and Water

The proposed restoration at the Site will involve the phased backfilling (using inert soils) of two on-site ponds (Pond B and Pond C) which are primarily considered to be groundwater ponds. The third pond (Pond A) is an intermittently dry surface water pond which will not be impacted by the proposed restoration works and will continue to provide an aquatic habitat at the Site. Both ponds A and B are acid oligotrophic ponds (nutrient poor) with limited connectivity with nearby surface water features from which aquatic fauna could enter the ponds and are considered sub-optimal habitats.

An assessment of potential affects upon Natura 2000 sites concludes that the majority of the SACs and all of the NHAs (four) within the vicinity (<15 km) of the Site are hydrologically isolated and distinct from the Site and would be unaffected by the proposed restoration works. It is also concluded that the River Boyne and River Blackwater SAC will remained unaffected by the proposed activities although it is potentially connected to the Site via the Balrinnet stream. Evidence to support this conclusion is based on the results of the water impact assessment (Chapter 6) which highlights the fact that water quality in the Balrinnet stream/River Glash has remained the same before and during previous excavation activities at the Site and the proposed restoration will use inert waste soil to restore pre-excavation levels which are not anticipated to result in any changes to water quality.

In the long term, habitats on site will transition toward a predominantly terrestrial environment returned to traditional agricultural use, which may provision elements of species-richness (breeding birds and small mammals) associated with field margins and increased provision of hedgerows and therefore have a slight beneficial impact and overall positive impact at the Site.

12.9 Biodiversity and Air

Activities on Application Site may create dust which can have an impact on biodiversity. Dust deposition rates recorded at the Site were below the recommended guidelines level of 350 mg/m^2/day. Mitigation measures outlined in Chapter 7 will be adhered to during the proposed restoration plan and it is expected that the impact to air quality at the Site will be not significant or imperceptible.

12.10 Biodiversity and Noise

Noise will be generated from the proposed restoration activities at the Application Site. The noise levels at the Site may affect some birds and mammals particularly those sensitive to noise. As previously outlined above in Section 12.8, in the long term, habitats on site will transition toward a predominantly terrestrial environment and it is expected that some species will re-settle in areas of additional/alternative habitat available in the vicinity of the Site. Flora and fauna is expected to recover to conditions prior to excavation or re-adjust once activities have ceased and restoration has taken place.

12.11 Soils / Geology and Water

The proposed restoration activities can have an impact on the water environment. The proposed restoration will involve the phased backfill and restoration of an existing sand and gravel quarry using uncontaminated soil and stone. The proposed restoration will use the waste acceptance methodology and criteria to establish soil trigger values that are reflective of natural concentrations of key parameters and ensure the restoration activities do not introduce new hazards to the Site. Furthermore, once the proposed restoration plan is completed, there will be no direct pathway to groundwater. Mitigation measures will be adhered to which will reduce any potential impacts on the receiving environment and it is expected that there will be no long-term deleterious impacts on the remaining aggregate, bedrock or groundwater at the Site.

12.12 Soils / Geology and Landscape

Restoration at the Application Site will tie into surrounding land contours therefore the potential impacts relate to the active restoration phase where there will be a considerable amount of activity within the site in the form of workers and earth moving machinery, though most of this activity will remain below surrounding ground / berm levels and therefore out of site until the near final finished levels are achieved. Thus, effects from site related activities will be temporary in nature and of a Low magnitude. Once the restoration is complete and grassland has been restored to the infill mound, there will be little or no discernible impact on the local landscape character other than a positive one in comparison to the existing quarry.

In terms of physical impacts on the site, the proposal is seeking the infill and restoration of an existing, exhausted quarry. The waste will be formed into a subtle mound, thereby echoing the esker that previously existed on this site. In effect the landscape is being reinstated and returned to its former agricultural land use and the end-use mound will not appear incongruous in this landscape setting, particularly as part of the former esker remains in place just beyond the site as a reference. The physical impact on the site is therefore considered to be positive in nature.

It is anticipated that the proposed development is likely to be difficult to discern beyond its immediately enclosed setting and is very unlikely to give rise to any significant landscape or visual impacts beyond approximately 1km.

12.13 Soils / Geology and Material Assets

Former activities at the Application Site included the extraction and processing of sand and gravel for general use primarily in the construction industry. The Application Site is planning to move into the backfilling and restoration phase of works, this is perceived as providing a net gain to the local area and will contribute to the direct employment of two people at the Site and create indirect employment in a number of service areas and industries.

12.14 Water and Material Assets

The proposed restoration activities at the Application Site will see the backfilling of previously excavated areas which uncontaminated soil and stone.

Once the restoration works are completed, there will be no direct pathway to groundwater on the Site and there will be no interaction with the water environment once the appropriate mitigation measures described in Chapter 6 are employed.

12.15 Landscape and Material Assets

Restoration activities at the Application Site within the context of the central study area will result in an **Imperceptible / Positive** landscape impact. Visual impacts during the active restoration phase have been considered to result in a **Slight imperceptible** significance of landscape impact. Once the restoration is complete and grassland has been restored to the infill mound, there will be little or no discernible impact on the local landscape character other than a positive one in comparison to the existing quarry.

Construction of vegetated screening berms and additional planting 'to' existing hedgerows will reduce the visual impacts to residences and people using the road network. The lands are to be restored to provide tillage and grassland for agricultural use, allowing the lands to be assimilated back into the landscape/ environment thus resulting in an **Imperceptible / Positive** in the longer term.

12.16 Material Assets and Archaeology& Cultural Heritage

Due to the presence of an archaeological site (Ballinderry Burial ground) in the south of the Site and other archaeological sites within the vicinity of the proposed development it is possible that previously non-detected sub-surface archaeological remains may exist. However, as stated in Chapter 11 it is expected that there will be no direct or indirect impacts to the Ballinderry Burial ground or nearby archaeological sites as the proposed restoration works are confined to the existing quarry void area.

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