CHAPTER 4

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ALTERNATIVES

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QUARRY CONSULTING

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CHAPTER 4: Alternatives

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Introduction

4.1 The proposed development comprises the following:

- Continued use of the existing quarry to the permitted depth of minus 5 mOD, including drilling, blasting, crushing, processing, stockpiling of materials, associated roads and ancillary services (granted under Planning Ref. File No.: 09/1958 and ABP Ref.: PL07.235821);
- Continued use of open storage areas;
- Continued use of existing permitted concrete manufacturing facility (granted under Planning Ref. File No. 09230 and 19/517: ABP-304769-19);
- Continued use of the existing office (granted under Planning Ref. File No.: 09/1958 and ABP Ref.: PL07.235821);
- Continued use of the existing maintenance shed (granted under Planning Ref. File No. 09610);
- Continued use of the existing water management system (including settlement lagoons), weighbridge and wheelwash;
- Lateral extension of the existing permitted quarry area over a previously permitted extraction area (granted under Planning Ref. File No. 06/4125) of c.4.6 ha. area to a final floor level of minus 5 mOD. The total quarry extraction area will be c. 13 Ha.;
- Restoration of the application area to natural habitat after uses following completion of extraction.

4.2 The proposed development is within an overall application area of c. 27.5 hectares and is for a total period of 22 years (comprising an operational period of 20 years followed by 2 years for restoration).

EIA Directive

4.3 Annex IV of the amended EIA Directive, 2014/52/EU, requires a description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.

4.4 This chapter recognises and fulfils this requirement in respect of the Proposed Development.

4.5 In this context, the consideration of reasonable alternatives and design evolution has been undertaken with the aim of avoiding and / or reducing adverse environmental effects (following the mitigation hierarchy of avoid, reduce, and, if possible, remedy), while maintaining operational efficiency and cost – effectiveness, and considering other relevant matters such as land and planning policy.

4.6 This chapter provides an analysis of alternatives which have been considered for this proposed development in terms of the following:

- 'Do Nothing' Scenario;
- Alternative Sources of Aggregates;
- Alternative Locations;
- Alternative Designs / Layouts;
- Alternative Processes.

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Need For the Development

4.7 This section examines the demand for construction aggregates, specifically limestone aggregates, in Galway and Ireland. The aim is to provide a comprehensive understanding of the existing demand for these aggregates, demonstrating the need for the development of new sources.

4.8 The demand for construction aggregates, particularly limestone, has been steadily increasing in Galway and throughout Ireland, driven by the growth of both infrastructure projects and the local concrete production industry.

4.9 Galway and the surrounding western region of Ireland are experiencing considerable expansion in housing, infrastructure, and commercial development. As these sectors grow, there is an increasing demand for construction materials like limestone, which is used in various forms, including as an aggregate for road base, foundations, and other construction applications, as well as in concrete production. Major drivers of this demand include:

- Residential developments to address the region's housing needs.
- Commercial and industrial construction, which underpins local economic growth.
- Public infrastructure projects, such as roads and public facilities, which are part of the Irish government's National Development Plan (NDP).

4.10 Limestone is a core material for these developments, and the on-site concrete manufacturing facility ensures a steady supply of concrete products for local projects. The continued use and extension of the existing quarry will secure the long-term availability of limestone for both aggregate and concrete production, ensuring that construction projects remain on schedule and on budget.

4.11 Transporting limestone from distant locations increases environmental impacts, including higher carbon emissions and fuel consumption. The continuation of use and extension of the local quarry will:

- Reduce transportation distances, directly lowering emissions from heavy goods vehicles.
- Decrease the environmental footprint of the concrete manufacturing facility by sourcing limestone locally.
- Align with national sustainability objectives, contributing to Ireland's commitment to reducing its carbon footprint and managing natural resources responsibly.

4.12 By ensuring a local supply of limestone for both aggregate use and concrete production, this development supports the region's construction needs while addressing the environmental challenges associated with long-distance transport of materials.

Construction Aggregates

4.13 The construction industry in Ireland has experienced significant growth in recent years, contributing to the demand for construction aggregates.

4.14 In 2019, the construction sector contributed €9.5 billion to Ireland's economy in terms of Gross Value Added (GVA), representing around 2.8% of Ireland's total GVA, which stood at approximately €340.5 billion that year. By 2023, the sector's contribution grew to €12.7 billion, against a backdrop of a national GVA of €482.3 billion, underscoring the ongoing demand for housing, infrastructure, and commercial developments across the country.

4.15 Ireland, including Galway, has prioritised infrastructure development to enhance connectivity and support economic growth. The National Development Plan (NDP) 2021-2030 allocates a

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record €165 billion for capital investments over this period. This funding aims to support major infrastructure projects across various sectors, including housing, transport, healthcare, and education. It also emphasises environmental sustainability, with significant investments in climate action initiatives, such as renewable energy and public transport infrastructure.

4.16 Housing construction continues to be a significant driver of the demand for construction aggregates. The Irish government, through its *Housing for All* plan, now aims to build an average of 33,000 new homes annually until 2030, with a long-term goal of addressing the national housing shortage. This plan includes the construction of affordable and social housing, as well as measures to accelerate homebuilding across Ireland. In addition to new builds, ongoing renovation and refurbishment projects, including retrofitting initiatives to improve energy efficiency, further contribute to the rising demand for aggregates and other building material.

4.17 Commercial and industrial projects, such as energy related projects, office buildings, retail centres, manufacturing facilities, and warehouses, require substantial amounts of construction aggregates. For instance, the construction of Data Centre Parks in Ireland is estimated to require around 4.6 million tonnes of aggregates over the next decade (Irish Concrete Federation).

4.18 The public sector invests in various projects, including schools, hospitals, government buildings, and public infrastructure. For instance, the National Development Plan allocates significant funds for public infrastructure projects like public transport, education, healthcare, and social housing. These projects generate substantial demand for construction aggregates.

4.19 The transportation sector relies heavily on road construction and maintenance to ensure efficient connectivity. In Ireland, the government has allocated €10.6 billion for national road projects from 2022 to 2027 (Department of Transport, Ireland). Construction aggregates and asphalt are essential components for road building and maintenance.

4.20 Concrete is a key construction material, and its production requires substantial quantities of limestone aggregates. In Ireland, the annual consumption of aggregates for concrete production is estimated to be around 31 million tonnes (Irish Concrete Federation). Concrete is widely used in foundations, structural elements (e.g. wind turbine bases), and pavement construction, driving the demand for construction aggregates.

Project Ireland 2040

4.21 Project Ireland 2040 is a long-term national planning framework that sets out the strategic vision for Ireland's future development. It aims to shape sustainable growth and improve quality of life by focusing on balanced regional development, social infrastructure, and economic progress.

4.22 Project Ireland 2040 recognises the need for housing construction to address the housing shortage and accommodate population growth. It sets a target of building 550,000 new homes by 2040, which translates to an average of 33,000 new homes annually. The construction of these homes requires a steady supply of construction aggregates for various applications such as foundations and concrete production.

4.23 The project emphasises the importance of infrastructure development to support economic growth and improve connectivity. Investments are planned for road networks, public transport systems, utilities, and social infrastructure. These infrastructure projects require significant quantities of construction aggregates to meet the demand for concrete, road surfacing, and foundation construction.

4.24 Project Ireland 2040 aims to achieve balanced regional development by promoting investment and employment opportunities outside major urban centres.

4.25 Project Ireland 2040 recognises the importance of sustainable resource management, including the responsible extraction of construction aggregates. Further development of an existing

permitted limestone quarry in Galway aligns with this goal, as it allows for the local sourcing of construction aggregates, reducing the environmental impact associated with long-distance transportation and preserving existing resources in other regions.

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4.26 Given the increasing demand for construction aggregates in Galway and the wider region, there is a potential supply and demand gap. Existing sources may face limitations due to depleting reserves or transportation constraints. Further development at this existing limestone quarry would help bridge this gap, ensuring a reliable supply of construction aggregates to meet the demands of Project Ireland 2040 and support ongoing construction activities in the region.

Galway Country Development Plan (CDP) 2022-2028

4.27 The Galway County Development Plan for the period 2022-2028 recognises the importance of the extractive industry within the county and particularly its rural areas, as it provides:

- RD1-Rural Enterprise Potential:

  'To facilitate the development of the rural economy through supporting a sustainable and economically efficient agriculture and food industry, together with forestry, fishing and aquaculture, energy and extractive industries, the bio-economy and diversification into alternative on-farm and off-farm activities, while at the same time noting the importance of maintaining and protecting the natural landscape and built heritage which are vital to rural tourism. Development of Cafes, Art Galleries, Hot Desk Facilities etc. which are important to the rural economy.'

- MEQ1-Aggregate Resources:

  'Ensure adequate supplies of aggregate resources to meet future growth needs within County Galway and the wider region and to facilitate the exploitation of such resources where there is a proven need and market opportunity for such minerals or aggregates, and ensure that this exploitation of resources does not adversely affect the environment or adjoining existing land uses.'

The 'Do Nothing' Scenario

4.28 If no further extraction works within the planning application area are carried out, the existing permitted quarry and concrete manufacturing facility will complete its current extraction activities and be restored to natural habitat after-uses.

4.29 Such a shutdown would create a gap in the local market for construction materials, including aggregates and concrete products. The loss of a reliable, local supplier could lead to increased costs and delays for construction projects in the region, ultimately affecting the delivery of key infrastructure and development initiatives. Additionally, the environmental benefits of sourcing materials locally, such as reduced transportation emissions, would be lost.

4.30 In this scenario, the cessation of quarrying activities would have economic and environmental consequences, making it clear that the continued development of the existing quarry and concrete facility is a logical and sustainable option to support both local industry and the wider construction market.

Alternative Sources of Aggregates

4.31 There are several alternatives to sourcing traditional limestone for construction aggregates. These alternatives aim to reduce environmental impacts, optimise resource utilisation, and promote sustainable practices. Some alternatives include:

- **Recycled Aggregates**: Utilising recycled aggregates from construction and demolition waste can help reduce the need for extracting virgin limestone. Concrete and asphalt can be crushed and processed into reusable aggregates for various construction

applications. The EPA's National End-of-Waste Decision for recycled aggregates provides a framework for using these materials in compliance with environmental standards, promoting a circular economy in the construction sector. Even if all available construction and demolition (C&D) waste were fully recycled for use as aggregate, it would likely only account for 2-3% of the national demand for aggregates. This would still leave a significant shortfall in supply to meet the ongoing demand for high-quality limestone aggregates, particularly for infrastructure and large-scale construction projects.

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- **Recycled Concrete Aggregates (RCA)**: RCA is derived from the demolition of structures and involves crushing and screening concrete. While it is useful in many construction applications, its end use is limited compared to the superior properties of virgin limestone aggregates.
- **Recycled Asphalt Pavement (RAP)**: RAP involves crushing and reusing old asphalt pavement in new construction projects. This process saves natural resources and reduces waste disposal costs, though it is generally more applicable for road construction than limestone replacement.
- **Manufactured Aggregates**: In some cases, aggregates can be manufactured from industrial byproducts such as slag or fly ash, providing a sustainable alternative. However, these materials often require significant processing and may not offer the same quality as natural limestone.
- **Marine-Derived Aggregates**: In some countries, aggregates are sourced from marine dredging operations. Although this is not currently feasible in Ireland due to regulatory restrictions, marine aggregates are a potential future alternative.

4.32 While these alternatives offer opportunities to reduce reliance on limestone extraction, fully replacing limestone quarries is neither feasible nor practical due to the following reasons:

- **Quality and Suitability**: Limestone is a naturally occurring material with unique characteristics, making it particularly suitable for construction applications such as concrete production and road base layers. Recycled or alternative aggregates often differ in quality and may require additional processing to meet required standards.

Alternative Locations

4.33 The current planning application is for the continued operation and extension of an existing established quarry and concrete manufacturing facility at Barrettspark, Athenry, Co. Galway.

4.34 When considering alternative locations for quarrying, it is essential to acknowledge that minerals can only be extracted where they naturally occur, as they are a "tied resource." Limestone aggregates, like many other minerals, are generally of low unit value, with transportation being the most significant cost. As a result, most quarries tend to operate within a radius of approximately 25-30 km of their target market. The quarry site benefits from being strategically located near the M6 and M17/M18 motorways and within close proximity to key areas: within c. 6km northeast of Oranmore c. 7 km west of Athenry, c. 7 km southeast of Claregalway, c. 13 km east of Galway City, c. 19km northeast of Kinvarra, c. 20km east of Bearna, c. 21km east of Moycullen c. 22 km northwest of Loughrea, c. 23km south of Tuam, c. 25 southeast of Headford, and c. 26 km north of Gort (refer to EIAR Figure 1.1).

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4.35 This site serves a large region of Galway, where strong transport links already exist. With the increasing emphasis on reducing carbon emissions and promoting sustainability, the practical transport range for aggregates is expected to contract. Reducing the distance materials are hauled helps to minimise the carbon footprint of quarry operations and supports more sustainable development practices.

4.36 Additionally, it is often preferable, from a planning perspective, to allow for the extension of existing mineral workings rather than opening new quarries on 'greenfield' sites. The need for and the economic benefits of stone and aggregate extraction are established in national guidelines, regional policy and the County Development Plan. Extending the existing quarry, that has been subject to previous Environmental Impact Assessments, offers lower development costs due to the availability of an operational quarry face and the presence of existing infrastructure.

4.37 The Applicant has considered the following alternatives:

- Deepening the extraction area within the current permitted quarry zone;
- Expanding operations into lands west of the existing quarry extraction area, which do not currently have planning permission for quarrying, and completing the restoration of the established quarry;
- Developing a new 'greenfield' quarry elsewhere in Galway to serve established clients and markets.

4.38 At present, there are no suitable alternative replacement quarry locations available to the Applicant in County Galway. It is generally accepted that developing a new 'greenfield' quarry, from site selection to planning, land acquisition, and preparation, through to the commencement of extraction, can take between 5 and 10 years.

4.39 Extending the existing quarry offers several planning benefits, including:

- Avoiding the extraction of additional materials from other quarries in the county, which could lead to faster depletion of their resources and potentially increase the intensity of operations at those sites;
- Preventing the need for a new 'greenfield' quarry elsewhere in the county where no prior extractive activities exist;
- Reducing the need for hauling materials from other quarries within or outside the county, which would result in longer haulage distances and increased traffic on the road network.

4.40 Further development of the existing limestone quarry at Barrettspark townland will help maintain a proven aggregate resource, with no significant increase in environmental emissions.

4.41 As mentioned earlier, this type of development is tied to the location of the resource, unlike a factory, which can be sited in various locations. Aggregates must be worked where they are found, and this can only occur where the environmental impacts of extraction can be managed to an acceptable level.

4.42 The existing permitted quarry site has a proven track record of compliance with environmental and planning regulations. Therefore, extending the quarry (along with final restoration), subject to continued implementation of best environmental management practices and compliance with planning conditions and recommended emission limits for the sector, is preferable to developing a new 'greenfield' site in Galway. The existing on-site facilities for manufacturing concrete products further support the suitability of this location, as the integration of quarry operations with manufacturing plants allows for reduced transportation and lower overall environmental impact.

4.43 The site offers several advantages for quarry extension, making it highly suitable for continued development:

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- Proven limestone reserves (see EIAR Chapter 7: LSG).
- Long-established history of extraction activities at the location.
- Nearby access to the M6 and M17/M18 motorways, facilitating transportation to key markets (see EIAR Chapter 13).
- Absence of national, regional, or local environmental designations under the Habitats Directive, Birds Directive, or Wildlife Acts.
- Existing infrastructure that reduces development costs, as this is an extension of an established quarry.
- Use of best practice, industry-standard extraction, and processing methods.

ALTERNATIVE DESIGNS / LAYOUTS

4.44 Alternative designs, including alternative layouts within the site, were considered. The design layout that was chosen is considered to best minimise the potential impacts on the environment from noise, dust, and visual impacts.

4.45 When evaluating alternative layouts for the quarry extension, three primary options were considered:

- **Deeper Extraction with a Smaller Footprint:** One option was to go deeper, which would have limited the area of the extension. However, this approach was ultimately not pursued due to the potential for groundwater inflows. Extracting at a deeper level would require more complex water management strategies, potentially leading to higher operational and environmental costs.
- **Extraction in the Western Area of the Site:** Another alternative was to focus extraction activities in the western part of the site. However, this area is currently used for concrete manufacturing, water management infrastructure, and stockpile storage, all of which are critical to the quarry's operations. Relocating these facilities to accommodate extraction would not only result in higher costs but also cause significant disruption to ongoing activities. Additionally, such changes would have required substantial modifications to the water management system, potentially increasing the environmental footprint of the development.
- **Wider Area with a Higher Floor Level:** The alternative chosen was to extend over a larger area while maintaining the floor level at -5 metres Ordnance Datum (mOD). As outlined in the Water Chapter, this approach was selected as it knowingly limits the risk of groundwater inflows while still allowing for efficient resource extraction. This part of the site was previously approved planning permission and is largely disturbed from quarrying activities.

4.46 Ultimately, the selected layout represents the most balanced approach, considering operational efficiency, environmental impacts, and cost-effectiveness. The chosen design maintains the functionality of existing site infrastructure while allowing for the sustainable extraction of resources.

ALTERNATIVE PROCESSES

4.47 Coshla Quarries Ltd. are a company with extensive expertise in quarrying, aggregate production and concrete manufacturing. As part of this planning application, different extraction methods were considered to evaluate their suitability for the proposed quarry extension.

4.48 Rock breaking was explored as an alternative extraction method. While it offers the advantage of reducing vibrations and noise compared to traditional blasting, it is less efficient for large-scale operations due to slower production rates, higher operational costs, and increased equipment wear. Consequently, rock breaking was not deemed a viable alternative for this development.

4.49 Blasting, the preferred extraction method, provides significant operational advantages. It allows for the efficient removal of large volumes of material, reducing overall costs and ensuring timely delivery

of resources to the on-site manufacturing plants. Blasting will continue to be employed, with strict environmental controls and monitoring in place to mitigate any potential impacts on surrounding areas – refer to Chapter 11.

4.50 The on-site integration of quarrying and manufacturing processes represents a logical and sustainable approach to development. It ensures efficient resource use while minimising environmental impact, aligning with best industry practices and the company's long-term sustainability goals.

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Comparative Analysis of Environmental Effects

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4.51 This section provides a detailed comparative analysis of the environmental effects associated with the proposed development and its alternatives. The alternatives considered include the 'Do Nothing' scenario, alternative sources of aggregates, alternative locations, alternative designs and layouts, and alternative extraction processes. Each alternative has been evaluated based on its potential environmental impacts, including air quality, water resources, biodiversity, noise and vibration, landscape and visual effects, traffic, and waste management. The comparison aims to demonstrate the rationale for selecting the preferred option while ensuring that environmental considerations are at the forefront of the decision-making process. The following tables outline the key environmental aspects associated with each alternative and highlights the most sustainable and least impactful approach.

Table 4.2: Environmental Comparative Analysis of Alternatives: 'Do Nothing' Scenario; Alternative Sources of Aggregates; Alternative Locations

Environmental Criteria	'Do Nothing' Scenario	Alternative Sources of Aggregates	Alternative Locations
Air Quality	Potential for improved air quality post-restoration.	Increased emissions from transportation and processing.	Potential dust emissions from new site preparation.
Noise Pollution	Reduction in operational noise.	Noise from transport and processing facilities at off-site locations.	Increased noise from new site operations.
Water Quality	Potential improvement with cessation of quarrying activities.	Risk of contamination from transportation runoff.	Potential impacts on local water bodies from new development.
Biodiversity	Habitat restoration opportunities.	Potential disturbance to natural habitats from material sourcing.	Potential habitat loss and fragmentation.
Land Use	Restoration to natural habitat.	Increased pressure on other land uses for material sourcing.	Significant land use change required for new quarry site.
Waste Management	No further waste generation from quarrying activities.	Increased waste from processing and transport operations.	Potential for increased waste generation at new location.
Visual Impact	Improvement over time as site is restored.	Visual intrusion at new transport and processing sites.	Significant visual impact from greenfield development.
Climate Impact	Increased carbon footprint from sourcing materials from other locations.	Higher emissions due to transportation and processing.	Increased emissions from infrastructure development.
Preferred Option	✗ Not Preferred	✗ Not Preferred	✗ Not Preferred

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Table 4.3: Comparative Analysis of Environmental Effects for Alternative Layouts / Designs

Criteria	Deeper Extraction with a Smaller Footprint	Wider Area with a Higher Floor Level (Preferred)	Extraction in the Western Area of the Site
Water Management	Increased risk of groundwater inflows requiring complex systems.	Minimal risk of groundwater inflows, manageable with existing systems.	Modifications to water management infrastructure required.
Noise and Vibration	Reduced spatial impact, potentially more intense operations at depth.	Balanced noise impact due to wider distribution of activities.	Increased potential for noise near operational infrastructure.
Visual Impact	Less visible due to smaller footprint.	Effective use of landscaped berms for screening.	Increased visual impact from operational disruptions in the western area.
Operational Disruption	None as existing footprint is used.	Minimal; aligns with current operations.	High; relocation of critical infrastructure needed.
Environmental Footprint	Increased due to more energy-intensive water management.	Optimised for resource extraction with minimal additional footprint.	Larger footprint due to relocation and reconfiguration of infrastructure.
Cost	Higher due to deeper extraction area.	Cost-effective; leverages existing infrastructure.	High due to relocation of existing facilities.
Overall Feasibility	Not preferred due to operational and environmental challenges.	Preferred; most balanced and sustainable approach.	Not preferred due to significant disruption and increased costs.

CONCLUSION

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4.52 In conclusion, the alternatives assessment conducted for the proposed continued use and extension to the existing limestone quarry and continued use of the existing concrete manufacturing facilities has revealed that there are no viable or reasonable alternatives available. The project team thoroughly evaluated various alternatives, considering factors such as environmental impact, feasibility, economic viability, and social considerations. However, none of the alternatives presented a suitable solution that could effectively meet the project objectives while minimising adverse impacts on the environment and surrounding communities.

4.53 The evaluation process considered potential alternatives, including alternative locations for the extension, alternative extraction methods, and alternative materials sourcing. However, these alternatives were deemed impractical, economically unviable, or resulted in significant environmental and social drawbacks that outweighed any potential benefits. Additionally, the limestone deposit in the proposed extension area is crucial for the continuous supply of limestone, which is essential for the regional construction industry and various infrastructure projects.

4.54 It is important to note that the project adheres to all relevant regulations, guidelines, and best practices to mitigate and manage environmental impacts. The project team has developed robust mitigation measures and monitoring plans to minimise disturbance to the natural habitat, control noise and dust emissions, and address any potential impacts on water resources.

4.55 The project team is committed to implementing appropriate mitigation measures and rehabilitation plans to restore and rehabilitate the affected areas to their pre-construction state or an improved condition.

4.56 Overall, the comprehensive alternatives assessment has determined that the proposed continued use and extension to the existing limestone quarry and continued use of the existing concrete manufacturing facility represents the most appropriate and viable option.