

**REPORT**

# EIAR - Non-Technical Summary

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Submitted to:

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## NON-TECHNICAL SUMMARY

### 1.0 INTRODUCTION

Golder Associates Ireland Ltd (“Golder”) have been commissioned to prepare this Environmental Impact Assessment Report [EIAR] to accompany an application for permission for further development of an existing quarry over approximately 26.87 hectares [ha.] at Windmillhill, Rathcoole, Co. Dublin. This EIAR is submitted on the instruction of Mr. Laurence Behan, owner and operator of this quarry who will be making the application for permission.

It is noted that this EIAR has been prepared in tandem with an rEIAR to accompany an application for substitute consent for that existing quarry under Section 261A of the Planning and Development Act, 2000 as amended by the same applicant.

This document is a Non-Technical Summary (NTS) of the EIAR, and its purpose is to describe the Proposed Development and provide a summary in non-technical language of the key findings of the EIAR submitted to An Bord Pleanála (ABP) in support of the application for permission for further development.

The proposed development site (application site) lies at the centre of a contiguous, established landholding of approximately 73 ha. That landholding is centred on the townland of Windmillhill and covers much of that townland area, with minor portions of that the landownership extending north-westerly into the townland of Steelstown and south-easterly into the townland of Carrigeen.

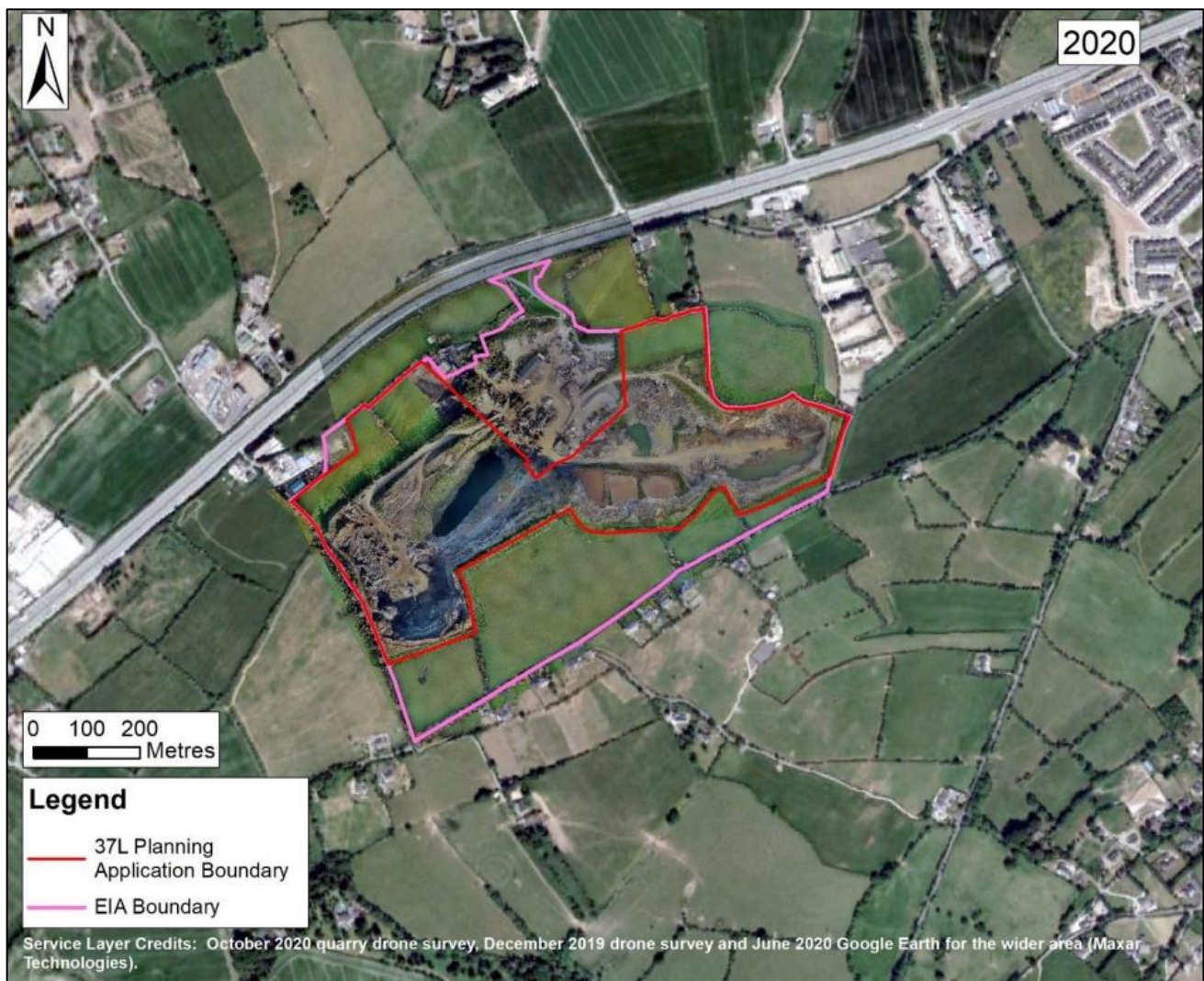
The centre of the landholding has been the subject of historic, current and intended future extraction of rock, and is roughly rectangular in shape with its long axis orientated parallel to the N7/M7 (Naas Road). The southern boundary is delineated by the local Windmillhill Road (L6065) and the western and eastern boundaries of this area by the Windmillhill townland boundaries. This area extends to approximately 46.14 ha. and constitutes the EIA project boundary for this quarry.

The lands the subject of this EIAR [the subject lands] at 46.14 ha. entirely encompass the application lands of 26.87 ha. The reserve at this quarry is greywacke rock, overlain by boulder clay, currently worked to an average depth of 173 mAOD.

The reserve is excavated by blasting and mechanical means, and primarily processed by mobile plant at the working face. Excavated material is transported to a centrally located existing administration and processing plant area over approximately 5 ha. that holds further processing plant (washing, screening, grading, bagging), an asphalt production plant and concrete plant. This plant and processing area is an established part of the quarry area and has also been formerly used for the recovery of inert C&D waste.

To note, a Stage 1 Screening Report for Appropriate Assessment (AA) has been submitted to accompany this planning application. This assesses the potential effects which may occur on Natura 2000 sites and associated qualifying species as a result of the Proposed Development.

Figure 1 provides a depiction of the application area and the EIA project boundary



**Figure 1: Location, Section 37L Planning Application Boundary and the EIA Boundary of the Proposed Development.**

## 1.1 EIA Scope and Methodology

Environmental Impact Assessment (EIA) is a process used to predict the adverse and beneficial impacts of a proposed development. It provides a means of drawing together the findings from a systematic analysis of the likely significant environmental effects of a scheme to assist planning authorities, statutory consultees and other key stakeholders in their understanding of the impacts arising from a development.

Certain proposed developments, due to their type, and scale automatically attract the requirement for EIA by a competent authority as part of that authority's formal assessment of the development proposal when that proposal seeks permission, consent or licensing. As set out in the next section, a hierarchical suite of European and national legislation and guidance govern EIA and direct EIAR content.

The permission for development sought in this instance is under Section 37L of the Planning and Development Act, 2000. This type of planning permission may only be sought where an application for substitute consent is in being.

In this instance the concurrent substitute application with rEIAR and this EIAR to accompany the application for further development of the quarry is by Order of the High Court [2018 No. 929 JR] of August 2020 that set aside

a previous substitute consent (ref. PL06.SU0068) and a S.37L (PL06S. QD0003) ref. application decisions and granting relief including:

*“...that a fresh application to the Respondent for continued development in relation to the site at Windmill Hill Rathcoole County Dublin pursuant to the notice dated 11 August 2015 issued by the Respondent in respect of section 37L of the Planning and Development Act 2000 as amended shall be deemed to have been made within the time limits prescribed therein where the application is made not later than twelve weeks of the date of perfection of this Order or such further period as the Board may allow...”*

Each technical environmental topic necessarily has separate legislative, policy and best practice requirements, however the assessments have applied the same overall standard approach. These include:

- Confirming the relevant legislative and policy context;
- Determining the applicable study area for that discipline;
- Establishing the baseline conditions for that discipline;
- Identifying potential receptors and their importance;
- Identifying potential sources of impact (change) to the receptors due to the Proposed Development;
- Applying a risk-based assessment methodology to evaluate the level of significance of environment effects resulting from each of the identified impacts;
- Where applicable, propose mitigation measures to avoid, reduce or remedy undesirable potential impacts, as appropriate, and thereby reduce the level of significance of each potential effect; and
- Conducting a final assessment of residual environmental effects, factoring in the measures and compensation strategies.

The EIAR was prepared by appropriately qualified and competent consultants as required by the EIA Directive (Directive 2011/92/EU, as amended by Directive 2014/52/EU). Further technical details concerning the scope and methodology of the EIAR have been provided in Chapter 2 of the EIAR.

The structure of the main EIAR document is laid out as follows:

- Chapter 1 – Introduction, Scope and Methodology;
- Chapter 2 – Project Description;
- Chapter 3 – Population and Human Health;
- Chapter 4 – Ecology and Biodiversity;
- Chapter 5 – Land, Soils and Geology;
- Chapter 6 – Water;
- Chapter 7 – Air Quality and Climate;
- Chapter 8 – Noise and Vibration;
- Chapter 9 – Cultural Heritage;
- Chapter 10 – Landscape and Visual;

- Chapter 11 – Traffic;
- Chapter 12 – Material Assets;
- Chapter 13 – Interactions;
- Chapter 14 – Mitigation and Monitoring Measures.

## 1.2 The Need for the Development and Consideration of Alternatives

The greywacke rock reserve at the subject location is of proven quality, capable of being used to produce aggregate for construction purposes and asphalt products. This EIAR is prepared to accompany an application for the continued extraction of reserves over a lateral extension of ca. 4.1 ha. to a final average working depth of 150 mAOD.

As with all aggregate extraction development the nearer the supply of aggregate to the market, the more economically viable it is and given the nature of aggregate deposits, quarries can only be worked where the sediments occur. Aligned to this economic situation is the environmental and social preferability of locally sourced aggregates. Aggregates sourced close to their market is preferable to that sourced at more remote locations as it lessens road traffic and associated environmental impacts and economic costs. Socially, the local sourcing of construction aggregate strengthens the local economy through job provision and associated spending, and exploits advantages and opportunities inherent in local supply chains.

Aggregates are an essential material for the construction industry and are used in all major development plans (including housing, road surfacing, infrastructure etc.). As such, they are of major significance to the overall growth of their local areas and the country and an important economic resource despite fluctuations in levels of construction due to wider economic forces, or the Covid-19 pandemic suspension of construction just ended at the time of writing this EIAR.

The purpose of this EIAR is to assess the site with regard to experienced / potential impacts on the environment, and to recount / propose measures to avoid, reduce or remedy undesirable potential impacts, as appropriate.

In this case, the quarry site represents the sole land asset upon which the developer's companies and employees rely. The developer has a personal intergenerational association with the lands and is a quarry operator and employer who wishes to maintain this asset as a sustainable extraction and processing development. In order for this operation to continue, planning permission for further extraction is sought to continue to feed market demand for aggregate and its products. The concurrent substitute consent application and rEIAR may only seek permission for development that has already occurred and as such the further extraction of reserve is the subject of this S.37L application and accompanying EIAR.

Maintaining the quarry site and adjacent suitable lands as a viable quarry, with associated processing facilities, will ultimately realise the extraction potential of this established quarry, and will maintain the direct and indirect jobs which have only lately returned to pre-recession levels.

### 1.2.1 Site Selection and Alternative Designs Considered

In this instance the EIAR has arisen as a direct requirement of the extraction area exceeding EIAR preparation thresholds. However, this extraction area occurs over an existing extraction site with minor lateral extension and is intended to utilise the plant and processing area the subject of a concurrent substitute consent. In other words, the site for which proposed development permission is sought is not a new site but rather an existing extraction site with contiguous lateral extension that will utilise a contiguous plant and processing area.

The necessity for the application this EIAR accompanies arises as the concurrent substitute consent application may only permit development already undertaken as a result of S.261A review. As such, without a S.37L

application and permission for further extraction of reserve, the continuation of the existing quarry would not be possible. Therefore, the site selection methodology employed is primarily driven by the existence of the existing quarry and remaining reserve at the quarry. In this way, the site selected was required to be functionally conjoined or capable of being conjoined to the extant plant and processing area and quarry entrance.

The Proposed Development represents the immediate reserve available for extraction at the Site: a lateral extension in a northerly direction to ensure aggregate product to meet existing market demand from the quarry site.

Also deployed in site selection methodology was a review of the Development Plan objectives for the area and previous reports prepared by the local planning authority in their S.261A Assessment, An Bord Pleanála's review of that assessment and the former subsite consent and S.37L applications arising at this quarry. In this regard, the presence of Windmill Hill Protected Structure no. 358 and the specific objective for the preservation of this structure is noted and detailed at Chapter 3 of the EIAR, alongside previous ground investigation of the lands around this structure as assessed in the Cultural Heritage Chapter (Chapter 9) of the EIAR. The area around the protected structure requires further archaeological investigation as to extent and importance. Therefore, it is not proposed to extend the current quarry void in a southerly direction at this time as was previously proposed under the quashed S.37L application.

Though it is evident that the Applicant holds significant landholding at this location, controlled lands to the west, east and south of the current EIA boundary are mainly on the opposite sides of public roads or accesses. The accessing of reserve at these locations, which are currently greenfield, would require detailed design of road crossing, or over / underbridge proposals that would require detailed design consideration and pre-application assessment by transport authorities and likely roads opening or similar licenses that are not currently sought. In addition, further lateral extension of the current quarry to the west, east or further south is not required at this time where there exists sufficient reserves, estimated at approximately 5 Mt, within the existing void and the proposed northern lateral extension. This remaining reserve is expected to be extracted at an average rate of ca. 500,000 tonnes per year, as has been the average for the previous approximately 25 years for the Site, and so gives rise to an expected lifespan of 10 to 15 years depending on market conditions.

The existence and continued use of the established quarry and processing complex will have less net environmental and economic impact than developing a new greenfield quarry.

## 2.0 PROJECT DESCRIPTION

### 2.1 Proposed Development Description

The subject lands have been used for quarrying since ca. 1710 and first obtained planning permission for rock extraction in 1968. As such, the quarry and associated uses are an established feature of the landscape, and the main feature of the EIA project lands.

The extracted area extends to 28.8 ha. and occupies the centre of the EIA project area. The quarry has a roughly oblong shape with a west-east axis of approximately 800 m, and a north-south axis of approximately 340 m.

The current average working depth of the quarry is approximately 173 mAOD. The reserve consists of greywacke (sandstone) and is extracted by blasting and mechanical means. The excavated material is crushed and screened at the working face by mobile plant, and transported to the central processing area for washing and grading. It is proposed to further develop this quarry by laterally extending the quarry void to the north by ca. 4.1 ha, giving a total application site area of 26.87 ha.

The N7/M7 national primary road (Naas Road) lies immediately north of the lands. The quarry Site is accessed from a left in / left out entrance via demarcated skip lanes off the N7/M7. A short avenue leads to an established

administration and processing area that occupies an area of approximately 5 ha. that was previously quarried. As a result, extraction in recent decades has been to the west and south-west, and east and south-east of this administration and processing plant area.

## 2.2 Major Accidents and Disasters

The EIA Directive (Directive 2011/92/EU, as amended by Directive 2014/52/EU), requires that an assessment is made of *'the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned'*.

The consideration of major accidents and disasters seeks to assess the relevant accidents and disasters which a Development is vulnerable to, and the relevant accidents and disasters that a Development could give rise to.

The objective of this assessment is to confirm that suitable precautions are taken into account for the Proposed Development and that the potential for significant adverse effects on the environment is reduced as far as possible.

Potential risks of major accidents and / or disasters which are inherent to quarrying operations include;

- Fire / explosion;
- Unplanned outages or disruption to services;
- Road traffic accidents resulting from Heavy Good Vehicle (HGV) movements;
- Contamination of the groundwater/ surface water;
- Flooding; and
- Falling debris or the collapse of benches or quarry faces.

The assessment was based on guidance of Major Accidents and Disasters from the Department of Environment, Heritage and Local Government (Guidance Document 1, A Guide to Risk Assessment in Major Emergency Management' (DEHLG 2010 Guidance)).

The assessment considered the Site's safety and management procedures and proposed environmental controls / mitigation when evaluating the appropriate classification.

The Site currently implements an emergency plan in their Site's Safety Statement and Site-Specific Risk Assessments. Once these plans are implemented and updated accordingly it is considered that the risk of major accidents will be appropriately addressed in line with the DEHLG 2010 Guidance.

## 3.0 POPULATION AND HUMAN HEALTH

The population and human health assessment describes the human environment and identifies and assesses any construction and operational related impacts from the proposed activities at the Site. The human environment and potential impacts on the 'quality of life' as a consequence of the Proposed Development's operation have been discussed under the following headings:

- Populations;
- Employment;
- Amenity;
- Land-use;
- Human health; and



- Health and safety.

### Impact Assessment and Mitigation Measures

An assessment of residential receptors during the assessment period has been made in relation to a 500 m EIA boundary offset. A total of 39 No. existing third-party residential dwellings are found to be currently within 500 m of the Site boundary, of these 16 No. receptors are located within 250 m of the Site boundary. The number of residences is based on a field survey, a review of aerial photography during the assessment period, DCCAE Eircode mapping and a local authority planning permission search. Three properties owned by the Applicant and located within their land holding have been identified within 250 m of the boundary.

Potential impacts to human health from effects of the Proposed Development to water surrounding the Site include discharges to the underlying groundwater. This could result in a change in water quality depending on the activities that are undertaken. There is the potential for impacted underlying groundwater to migrate to local groundwater wells and effect the users of such water supplies.

The potential associated health impacts were assessed via the biophysical factors of air, water, and noise and vibration by the appropriate chapters in the EIAR.

Potential impacts to human health from the air include dust generating activities on the Site and increase in concentrations of airborne particles, emissions from the asphalt plant, nitrogen dioxide due to exhaust emissions from diesel powered vehicles and equipment used on site and vehicles accessing the Site.

Impacts to human health from excess noise and vibration on site may result in; hearing loss and various vibration syndromes of workers from high level occupational exposure; and also annoyance and effects on mental health in the surrounding residential receptors.

The Proposed Development also has the potential to impact on local businesses, rural enterprise and amenities surrounding the Site.

The various assessments undertaken indicated that there will not be significant adverse effects on the human environment, amenity and health as a result of the Proposed Development. Some small positive economic factors are identified through the creation of local employment both directly and indirectly.

## 4.0 ECOLOGY AND BIODIVERSITY

### Study Area

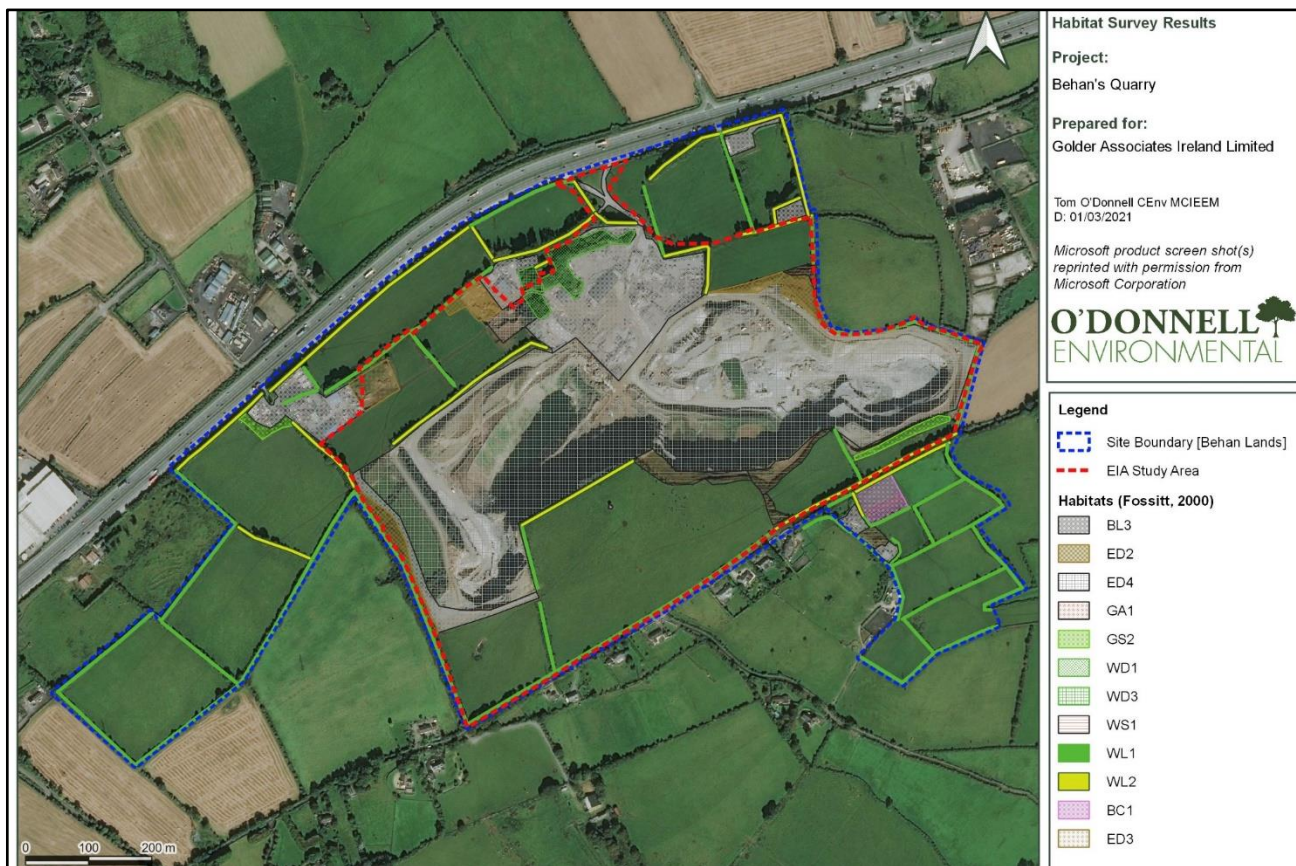
The ecology and biodiversity chapter considers the effect of the Project on ecology and biodiversity.

In order to establish what species and habitats may occur at the Site a study area was defined. The study area for ecology and biodiversity includes all habitats, including the built form, within the EIA Study area which is shown on Figure 2 below.

### Method and Guidance

Baseline ecological surveys within the Study Area have occurred since 2015 and are on-going during 2021. Good practice survey methods have been used throughout this work as described in Chapter 4.

The impact assessment methodology used is as defined within the second edition of the *Guidelines for Ecological Impact Assessment in the UK and Ireland* (Chartered Institute of Ecology and Environmental Managers (CIEEM), 2018). In accordance with CIEEM guidance (2018), the value of habitats and species has been measured against published selection criteria defined by the CIEEM (2018), where available.



**Figure 2: The Study Area and Habitat Map.**

## Existing Baseline Conditions

### International Designations (Natura 2000 sites)

There are six Natura 2000 sites located within 15 km of the proposed development, as listed below:

- Red Bog, Kildare SAC – (ca. 7.5 km south of the Site);
- Poulaphouca Reservoir SPA – (ca. 10 km south of the Site);
- Wicklow Mountains SAC (ca. 12 km south east of the Site);
- Wicklow Mountains SPA (ca. 12 km south east of the Site);
- Glensamole Valley SAC (ca. 7.5 km east of the Site); and
- Rye Water Carton SAC (ca. 10 km north of the Site).

### National Designations (NHAs) and pNHA

No Natural Heritage Areas (NHAs) were identified within 5 km of the Site. However, three proposed NHAs (pNHAs) were identified.

- Kilteel Wood pNHA (ca. 4 km South of the Site);
- Slade of Saggart And Crooksling Glen (ca. 3 km south-east of the Site); and
- Grand canal (ca. 4 km north-west of the Site).

## Habitats

The Site is dominated by improved agricultural grassland (GA1 - Fossitt (2000)). For clarity and ease of use, GA1 is not mapped within Figure 2 above, and consists of all areas within the study area not otherwise mapped. Discrete areas of scrub, arable, hedgerow and semi-natural woodland were also recorded.

## Fauna Assessment

Walkover surveys and camera trapping were carried out to identify mammal species utilising the Site. Badger, rabbit and fox were all recorded on Site. A possible badger sett was also recorded within the Site. Some limited potential for roosting bats was recorded. It is also possible that bats use the Site to forage and commute.

The Site periphery, including boundary features is likely to be used by general passerine and farmland bird species using the hedgerows surrounding the Site for nesting and foraging. It is possible that Site operations have created habitat for some bird species, such as Jackdaws who frequently nest in crevices on exposed rock faces.

In addition, a Peregrine Falcon (*Falco peregrinus*) is known to make use of the quarry faces that would have otherwise not existed at the Site. There are no water courses running through the Site or directly adjacent to it. Ordnance Survey maps show that the nearest stream lies to the east and drains into the Griffeen River, which itself joins the River Liffey in the centre of Lucan village. The Tootenhill Stream flows in a north-easterly direction about 0.75 km to the east of the Site. Areas of open pooled water are noted on the quarry floor, and the absence of aquatic or marginal plants indicates that there is little or no residual biodiversity value in these features.

## Potential Effects

Given the nature of the assessment, the operational impacts are summarised below:

- Land take (permanent loss) ca. 5.19 ha;
- Habitat modification through anthropogenic effects;
- Disturbance to habitats and species through noise from traffic and blasting;
- Individual species disturbance / mortality; and
- Impacts of dust as a result of extraction activities.

Potential direct and indirect impacts from water quality and quantity are as follows:

- Local (Site based) Impacts of dust and Site runoff (sediments, fuel, etc.) as a result of quarrying activities; and
- Impacts on surface water quality within the Site.

## Mitigation and Management

Good practice management of plant and machinery will continue to be adopted to avoid pollution on Site. All retained habitats on Site will be suitably protected and habitat creation will occur at the Site to address tree and hedgerow loss on a 'like for like' basis. A restoration plan for the Site will be implemented which will detail all of the planting and habitat creation committed as part of the Project.

Bat activity surveys will be undertaken. and monitoring of the possible badger sett will also occur. A breeding bird (including Peregrine Falcon) survey has been undertaken and commenced in March 2020. The result of this work will form the basis of a Peregrine Falcon management and monitoring plan for the Site. To increase opportunities of roosting bats and nesting birds, a number of bat and bird boxes will be incorporated in the restoration plan for the Site, placed on trees of a suitable size. In addition, to increase opportunities for

invertebrates within the Site, invertebrate boxes will be provided under the restoration plan. These boxes will be located in sheltered areas of new and retained vegetation, in association with hedgerows.

### Residual Effects

The on-going operation of the quarry, committed delivery of mitigation measures and eventual restoration of the quarry is likely to result in all effects being considered to be not significant. In essence, this can be described as having no perceivable impacts on ecological features (habitat or species). Impacts may be beneath levels of perception, within normal bounds of variation. Depending on the efficacy of the restoration proposals at eventual closure of the Site, there may be an opportunity to provide a minor positive (net gain) for biodiversity value at the Site level.

## 5.0 LAND, SOILS AND GEOLOGY

This assessment considers the potential impacts and effects on soils and geology that can be reasonably foreseen as consequences of the normal construction and operation of the Proposed Development.

### Baseline Conditions

The Site contains agricultural fields, the existing quarry areas (including extraction areas and plant) and the proposed extension areas.

Three main land uses have been identified within the Site and the study area (500 m from the EIA boundary), these are agricultural and single-house residential lands, the N7/M7 road network and the quarry site. The lands to the north, west, south and east can be characterised as rural in nature, with land uses in the area being agricultural and single-house residential. Dry cattle, sheep rearing and grazing of horses are the main activities in the area, with further arable activities to the south-west.

Corine landcover classification (EPA, 2018) classifies the area the same as the adjacent N7/M7 road classification, that of 'Road and Rail Network', however the area of land should be classified as 'Mineral Extraction Sites' which is typical of such rock quarries. The lands to the south, east and west are defined as 'Agricultural Areas' and 'Pastures'.

A review of the South Dublin County Council Development Plan (2016 – 2022) indicates that the proposed north western extraction area is listed as a site 'to provide for Traveller Accommodation Sites to be Selected'. The Draft South Dublin County Council Traveller Accommodation Plan 2019 – 2024 further identifies that the site is an indicative location with sites to be selected depending on need. The South Dublin County Council Development Plan also identifies the Site sits within an area designated as 'Rural' in which extractive industry is 'Permitted in Principle' while Traveller Accommodation is 'Open for Consideration'.

There are no soils remaining in-situ in the existing extraction area due to extraction activities onsite. The plant area is composed of Made Ground (e.g. concrete pads, hard standing and concrete foundation areas for the plant area) overlying natural ground (soils). The northern, southern and western parts of the Site containing agricultural fields are underlain by natural ground.

The Irish Soil Information System layer (EPA, 2021) indicates that soils on the Site were once compositionally uniform across much of the EIA study area, prior to extraction activities. Superficial deposits were comprised of a clayey drift with siliceous stones, and these currently remain in-situ in the proposed north western and north eastern extension areas. These superficial deposits are described as glacial tills derived from Silurian bedrock.

Subsoils are mapped by the EPA (2021) as being sandstone and shale tills which have a clayey texture and are derived from Lower Paleozoic parent material around the northern perimeter of the Site and underlying the majority of the wider study area. The majority of subsoils underlying the quarry area have been mapped by the EPA (2021) as bedrock which is at surface, this extends into the south, west and east of the study area.

Four groundwater monitoring wells installed in March 2020 recorded a very thin soil cover (ca. 0.5 – 1 m thick) overlying a weathered/fractured greywacke, which becomes more competent with depth.

The Site is underlain by the Carrighill Formation of Silurian calcareous greywacke, siltstone and shale. The current visible floor of the existing quarry is at ca. 150 mAOD.

A review of available aerial photography indicates that the Site is the only extraction operation within the study area and no other designated geological assets or heritage sites are identified within the study area.

A review of the GSI's landslide susceptibility classification layer (GSI, 2021) indicates that the majority of the Site area has a classification of Moderately Low to High susceptibility.

The Radon Map for Ireland (EPA, 2021) indicates that the Site and study area are located in an area where between 1% and 5% of homes are estimated to be above the radon reference level.

### Impact Assessment and Mitigation Measures

Four main sensitive receptors were identified in the impact assessment for the Site: superficial deposits (soil/subsoils), bedrock geology, land (agricultural land and potential Traveller Accommodation) and human health. These are classified as of negligible, medium, low and high sensitivity respectively.

The main potential impacts and associated effects considered were as follows:

- Activities or events that might impact land quality (e.g. leaks and spills from machinery or stored substances, or discharges);
- Change of land use/land take (i.e. loss of agricultural lands and loss of potential lands for Traveller Accommodation);
- Loss of superficial deposits and bedrock; and
- Destabilisation and/or subsidence of unconsolidated soils, sub-soils or rock faces.

For activities or events that might impact land quality, the magnitudes associated with the potential groundwater and surface water impacts at the Site were assigned as negligible or low.

Change of land use/land take will occur in the extension areas to the northwest and northeast, however, the lands are of low value and low productivity as an agricultural resource. Also, two alternative sites exist within close proximity to the Site which could be used as suitable alternative sites to provide Traveller Accommodation.

Loss of superficial deposits and bedrock can be considered temporary in nature for the former and permanent for the latter. Superficial deposits are very thin (ca. 0.5 – 1 m) and of low value locally, the removed soils will remain in the immediate area as they are to be utilised at the margins of the disturbed area as screening berms. By the nature of quarrying the underlying deposit of rock will be removed which will result in a direct and irreversible impact on the Site, and the deposit has a medium/high resource potential and will be used in construction projects in the greater Dublin region with ca. 5 Mt to be extracted.

General earthworks (e.g. excavation, soil movement, ground compaction, stockpiling, reprofiling) have the potential to affect human health of workers if they were to become unstable. Stability issues may also arise during the excavation of the quarry faces and the construction and management of the silt ponds.

The extraction plan for the proposed extension has incorporated industry standards for quarry face and slope design, thus mitigating any potential geotechnical / geohazard risks.

The management of the existing quarry faces, and silt ponds will be in accordance with the Health and Safety Authority's 'Guidelines to the Safety, Health and Welfare at Work (Quarries) Regulations 2008, (as amended), and the recommendations of geotechnical appraisals will be carried out on site.

Mitigation through embedded design and mitigation measures determines that the proposed development is unlikely to have significant adverse effects on the land, soil or geology environment at, or surrounding the Site. In all cases the residual adverse effect is not significant and not greater than slight.

## 6.0 WATER

### Baseline and Subsequent Conditions

Water enters the Site through direct rainfall precipitation and via the movement of groundwater through the subsurface which predominantly flows from southeast to northwest, coincident with local topography. In the excavated areas of the Site in the eastern and western areas water is present in the lowest elevations of the pits. The excavations on the Site intersect the groundwater table and therefore ponds are considered to be a mix of both groundwater and rainfall. Once present in the pit this water mass will be subject to evaporation and will provide some recharge to the underlying bedrock. Rainfall on other areas of the Site will predominantly infiltrate the ground where it will be subject to evapotranspiration or becomes recharge to groundwater.

Bedrock underlying the Site is classified as unproductive. Flow in the bedrock is likely to be predominantly confined to bedding planes, faults and fractures due to the fine-grained, low porosity nature of the bedrock. Connectivity of fracture sets within the bedrock is expected to be low, with limited lateral connectivity (tens of metres from the Site) and limited connectivity of groundwater with off-site receptors (such as adjacent domestic water supplies). There may be zones of increased hydraulic conductivity in the unexcavated upper weathered zones (or shallow zones subject to blasting) which can allow for rapid infiltration of rainwater. This hydraulic conductivity decreases with depth as weathering of the rock reduces. Pumping at the Site is shown to cause drawdown localised to the quarried areas, with limited impact observed in the surrounding natural ground.

Groundwater quality within the central areas may be impacted due to activities at the Site, however quality results for boreholes located at the Site perimeter are generally good and further prove the dysconnectivity of the Site with surrounding receptors. Some exceedances of drinking water standards were noted, most frequently naturally occurring metals such as arsenic and some sporadic exceedances of hydrocarbons and total coliforms, which are interpreted to be derived from off-site sources. Bottled water is used as drinking water on-site.

There are no watercourses which pass through the Site boundary. Local surface water features are predominantly fed by rainfall runoff from higher topographical areas which collect in natural gullies and form headwaters for tributaries to larger streams and rivers. The topography of the Site and the surrounding area means that surface water runoff from the Site (e.g. in the event of flooding from the Site) could eventually reach the N7/M7 motorway or contribute to the River Griffeen, however assessment shows that there is sufficient attenuation capacity within the quarried areas to allow capture of rainfall under extreme storm events.

As part of the water management system on the site, water abstracted from the western quarry pit is discharged following periods of prolonged rainfall to a culvert located on the northern portion of the Site adjacent to the N7/M7 motorway. Water from this culvert is discharged into the motorway drainage system. It is unknown where the water in the motorway drainage system flows to from this point and may discharge to a tributary of the River Griffeen near Rathcoole. The water quality of the River Griffeen is generally shown to be good, with no exceedances of environmental quality standards and no effects identified regarding the potential discharge of pumped water via the motorway drainage system.

## Impact Assessment and Mitigation Measures

Three main sensitive receptors were identified in the impact assessment for the Site: groundwater (quality and level), surface water (quality) and floodplain areas associated with discharge to the River Griffeen. These are classified as being of negligible, medium and low sensitivity respectively.

No pathway was identified between the Site and Natura 2000 designated sites as these are located at distances exceeding 8 km from the Site and not in hydraulic connectivity with the Site. Equally, there is no pathway between the Site and human health receptors (both on-site workers and off-site residential receptors).

Mitigation through embedded design and remedial measures determines that the proposed development is unlikely to have significant adverse effects on the water environment at or surrounding the Site. In all cases the residual adverse effect is not significant and not greater than slight.

## 7.0 AIR QUALITY AND CLIMATE

This chapter presents an assessment of the potential air quality and climate effects associated with the continued operation of the Site. The effects have been assessed in the context of relevant national, regional and local air quality policies.

A qualitative assessment of dust impacts from the quarrying activities has been undertaken in line with Institute of Air Quality Management (IAQM); Guidance on the Assessment of Mineral Dust Impacts for Planning, 2016.

A traffic screening and quantitative operational phase assessment of effects from road traffic emissions has been undertaken in accordance with the Environmental Protection UK/Institute of Air Quality Management guidance document 'Land –Use Planning & Development Control: Planning for Air Quality' (EPUK/IAQM 2017), as part of the concurrent substitute consent rEIAR submitted for the Site. The assessment concluded that the impact of traffic on local receptors was not Significant. As there are no proposed changes to traffic flows associated with this application (and vehicle emissions are predicted to improve with time due to improvements in technology and emissions), impacts from traffic emissions are considered to be Not Significant and are therefore not considered further.

A quantitative assessment of combustion emissions related to the asphalt manufacturing site was undertaken as part of the concurrent substitute consent rEIAR. Detailed dispersion modelling was undertaken using the latest version (Version 5.2.2) of CERC ADMS5 dispersion modelling software, to predict concentrations of NO<sub>x</sub>, NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> at nearby sensitive receptors. The assessment concluded that the impacts from the operation of the plant on local receptors was Not Significant. As there are no proposed changes to the operation of the asphalt plant at the Site, impacts from the combustion emissions are considered to be not Significant and are therefore not considered further.

## Impact Assessment and Mitigation Measures

The background air quality has been classified using Site monitoring data gathered during 2020 and 2021 for dust, and EPA monitoring data for NO<sub>2</sub>, NO<sub>x</sub>, SO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>. Climate data for the area has been obtained from the Met Éireann station at Casement Aerodrome, Baldonnell, Co. Dublin, ca. 5.5 km northeast of the Site, and has been used to inform the dust assessment.

The assessment has also considered the potential climate impacts during the operational phase. The effect of climate change on the continued operation of the Site is discussed in relation to air quality, noise, landscape and visual, water and flood risk, geology, ground conditions and groundwater, and ecology and biodiversity. No additional mitigation or monitoring has been considered necessary as a result of continued operation of the Site in relation to climate change. Consideration to the potential greenhouse gases which may be generated from the ongoing operation of the Site is also included in the assessment.

The impact of coarse particulates (dust) on the surrounding area as a result of the ongoing activities at the Site is considered to be 'slight' and therefore Not Significant. The assessment considered the ongoing mitigation measures which will continue to be in place. With regards to fine particulates, it is considered that there may be the potential for an increase in PM<sub>10</sub> and PM<sub>2.5</sub> concentrations at the residential receptors downwind in the vicinity of the Site, but the PEC is still predicted to be below the annual AQS, with headroom. The impact of fine particle PC from the Site is therefore considered to be imperceptible and therefore Not Significant.

When considering all of the emissions to air associated with the ongoing operation of the Site, the impacts to air and climate are considered to be Not Significant.

## 8.0 NOISE AND VIBRATION

This assessment has considered potential noise and vibration impacts associated with the Proposed Development's extraction and restoration activities. The assessment has comprised characterisation of the baseline noise and vibration environment, adoption of appropriate evaluation criteria, prediction of noise levels at identified Noise Sensitive Receptors (NSRs) and specification of appropriate mitigation.

The primary source of noise from the development will include traffic, blasting, screening, and crushing of extracted materials, vehicle movements, intermittent noises, reversing alarms, and general plant and machinery.

The primary source of vibration associated with the proposed activity is blasting from the excavation of rock. Blasting results in ground borne vibrations and air-overpressure impacts. It is acknowledged that humans are particularly sensitive to vibration stimuli and that any perception of vibration may lead to concern.

The study area considered in this assessment comprises a buffer approximately 600 m beyond the quarry boundary. This area includes the receptors anticipated to be impacted by quarry operations. The closest receptors are located approximately 200 m south of the quarry boundary.

The noise environment at the closest NSRs to the quarry are noted to be dominated by road traffic noise from the N7/M7 dual carriageway. Operational noise from the quarry is sporadically audible at the Site's monitoring position and is inaudible at properties to the north, east and west of the quarry.

Noise modelling has predicted noise from proposed quarry activities to determine the likely worst-case contribution of proposed quarry operations to the noise environment. Two scenarios have been modelled to assess noise impacts from the proposed operations: the first scenario assessed excavation and mobile processing of materials; while the second scenario examined the loading and moving of trucks. In line with the operational hours of different activities, Scenario 1 was evaluated against the daytime target level, and Scenario 2 was evaluated against the night-time target level

Under Scenario 1 the predicted noise level due to quarrying activities was below the measured noise level at all NSRs except one which is owned by the applicant and was above the measured baseline ambient level by between 0.2 and 1.1 dB. Under Scenario 2 the predicted noise level due to quarrying activities under each scenario is below the measured noise level at all NSRs. Both modelled scenarios also made conservative assumptions and as such the predicted exceedances are unlikely to occur in practice. It should be noted that predicted noise levels are within the acceptable limits of the existing planning permission and those prescribed in Environmental Management in the Extractive Industry (Non-Scheduled Minerals) (EPA 2006)

Vibration measurements undertaken at the eastern and western boundary of the quarry throughout 2019 and 2020 were examined and these records are provided in the chapter's appendix. The maximum Peak Particle Velocity and air overpressure measurements comply with their respective limits. Future extraction and blasting activities are proposed to the north of the Site and closer to the Irish Water main line. The extraction methods and mitigation measures will be agreed in consultation with Irish Water (IW) prior to the commencement of extraction activities in the northern sections of the Site. Should further surveys be required then these will also



be commissioned in conjunction with the requirements of Irish Water. To reduce the potential of damage to the Irish Water pipeline numerous mitigation measures are currently employed during blasts; these are identified in detail in the chapter. The quarry will deploy a vibration monitor at the IW pipeline during all blasting events on the northern face of the quarry. From these monitoring records the blasting contractor can determine the margin of compliance with the vibration limit and if blast parameters require refinement for future blasting events.

With the implementation of these mitigation measures and controls it is considered that vibration effects on the IW pipeline from blasting are 'not significant'.

No significant noise or vibration impacts have been identified in the design and operation of the Proposed Development.

## 9.0 CULTURAL HERITAGE

This assessment considers the potential effects of the Proposed Development on cultural heritage during both the operation and decommissioning phases. The term 'cultural heritage' is used collectively to refer to all assets of archaeological, architectural and historical or cultural value. The assessment includes a detailed baseline study to establish the existing conditions, and an effects analysis and impact assessment that considers both direct effects (e.g. physical disturbance) and indirect effects (e.g. changes to setting due to dust and visual changes). The assessment of indirect effects is informed by the results of other assessments, including air quality, noise and vibration, and landscape and visual. Where required, appropriate mitigation measures have been proposed to avoid or reduce identified impacts.

In lieu of specific guidance from the Institute of Archaeologists of Ireland (IAI), the impact assessment conforms to the guidelines set out by the Chartered Institute for Archaeologists (CIfA, 2020a<sup>1</sup>; 2020b<sup>2</sup>).

### Impact Assessment and Mitigation Measures

There are five known cultural heritage assets within the Site, however these all lie outside the area of proposed extraction. As such, no direct effects are predicted to known designated or non-designated assets during operation. An imperceptible effect is predicted during operation as a result of indirect effects from noise, dust and visual changes to the setting of these known assets. The imperceptible significance of this effect reflects the baseline setting of the assets on the periphery of an existing quarry. Visual changes are expected to have an imperceptible to slight positive effect on 16 cultural heritage assets located within the wider Study Area. During decommissioning, when indirect effects to the setting of assets is expected to stop and the Site is restored, a slight positive effect is predicted for all assets.

There is potential for previously undiscovered archaeological remains to survive within the Site, including the two previously undeveloped additional extraction areas. If such remains do exist beneath the surface in these additional extraction areas, then there is potential for them to be directly affected by ground disturbance during operation, resulting in a potentially profound adverse effect. No additional ground disturbance is expected to occur during decommissioning and so no direct effects are expected during this phase.

To mitigate for the potential presence of undiscovered archaeological remains within the additional extraction areas, a phased approach is recommended. Initially, a geophysical survey of the two additional extraction areas will be undertaken. The results of this geophysical survey will then inform the further development of the mitigation strategy, including the need for further intrusive archaeological investigation. If required, this may

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<sup>1</sup> CIfA (2020a). Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment.

<sup>2</sup> CIfA (2020b). Standard and guidance for historic environment desk-based assessment.

range from archaeological supervision of soil stripping work by a licensed archaeologist, to trial trenching and targeted evaluation, to broader, more extensive archaeological excavation.

To ensure the protection of the five known assets from inadvertent direct impacts, the area will be clearly demarcated, and the presence, significance and protections afforded to these assets will be communicated to all staff working on site, as part of their environmental induction.

## 10.0 LANDSCAPE AND VISUAL

Despite its scale, views of the working quarry are generally hidden by the surrounding topography. The upper profile of the worked southern boundary does however stand proud of the tree cover within the quarry and in contrast to the surrounding local hills.

The Proposed Development will result in further excavation from the existing quarry void and expanding it laterally northwards across three small fields, over an additional 5.19 ha of which 4.1 ha will be extracted. This will result in loss of pasture cover and some boundary hedgerows and trees. The alternation to the landform across the agricultural lands set within the proposed extension area will be highly noticeable across the local landscape but limited over the wider landscape. Mitigation measures include the use of mounds and woodland planting along the revised boundary edges to help enclose the development. The implementation of the proposed landscape mitigation and remediation measures will increase the quantity and diversity of vegetation and habitat in the local landscape, as highlighted on the restoration plan (See Chapter 10).

Similarly, the viewpoint assessment found that this alternation of landform would be most apparent from those nearest visual receptors north of the proposed site which already experience clear views of the existing quarry's deep southern rock face. These affected receptors will experience a localised visual change of landcover from pasture to quarrying, with the associated site works gradually lowering the existing landform. This will open the lands up and potentially increase the visual prominence of the quarry within these views compared to the existing quarry's visibility. However, the landscape mitigation measures include new mounds and woodland planting across the boundaries of the affected fields to help screen inwards views, which will further reduce as the planting matures.

The ridgeline of Windmillhill, which is a South Dublin County Council protected prospect, helps to screen views of the existing quarry and proposed extension areas from the majority of receptors' views located south of the quarry and this ridgeline. Some limited receptors have partial views of the existing quarry's mounds on the southern boundary. However, the proposed mitigation measures will help to soften their appearance with woodland planting.

## 11.0 TRAFFIC

The objective of this Chapter is to assess the traffic impacts associated with the proposed development in terms of its integration with existing traffic on the surrounding road network. This assessment determines the impact on operational performance of trips generated by the development on the local road network.

Further development at the quarry proposes a lateral northward extension of the current quarry void over approximately 4.1 ha, (requiring a total additional land take of 5.19 ha. for landscaping berms), and a deepening to a final working base of 150 mAOD. The Proposed Development relates to quarrying only and is over an area of approximately 26.87 ha. The material extracted will be processed at the existing central processing area, with the current access being retained.

It is anticipated that extraction of the remaining reserve will occur over 10 to 15 years, depending on market conditions, with a further 5 years for restoration.

Twelve-Hour classified Junction Turning Counts (JTCs) were carried out on three consecutive days from Tuesday 13<sup>th</sup> to Thursday 15<sup>th</sup> October 2020 at the quarry access. The count was carried out between 5:00 am and 5:00 pm, with this time period encompassing the main operating hours of the quarry. The total number of trips has been calculated as 832, 806 and 828 trips respectively, which includes exported material and all staff, and miscellaneous, trips.

At the time of preparing this report Government enforced travel restrictions were in place nationally due to the COVID-19 pandemic. As a direct result of these travel restrictions, travel patterns on the N7/M7 are likely to have significantly reduced, and therefore may not be representative of typical travel patterns on the N7/M7. For this reason, it was not considered practical to undertake traffic counts on the N7/M7, as the results would not be representative of the average volume of traffic travelling on the N7/M7.

In lieu of traffic count data on the N7/M7 westbound carriageway, historical (pre-pandemic) AADT and peak hour figures, recorded and reported by the TII traffic counter TMU N07 015.0 W, were used to estimate the average daily traffic patterns.

The traffic generated by the quarry represents between 1.23% and 1.62% of total traffic on the N7/M7 National Road between 2020 and 2051, the final future forecast year. It is consequently concluded that the N7/M7 will have sufficient link capacity for each of the future assessment years with, and without, the proposed development.

The N7/M7 bounds the quarry lands to the north and is the main arterial road in the area. A search of planned adjacent developments which may have an impact on future traffic flows in the vicinity of the proposed development was undertaken and it is noted that there are no extractive or sizable industries in the surrounds of the site which may contribute to cumulative traffic from adjacent developments having an impact on the operation of the N7/M7 carriageway. The large volume of traffic on the N7/M7, as recorded by the TII traffic counters, relative to traffic generated by adjacent developments results in this dominating the baseline traffic data.

For the purposes of the traffic flow capacity assessment at the quarry access, the existing road layout at the left-in/left-out junction was assessed in accordance with the permitted traffic volumes for this type of junction layout, as detailed in Chapter 7 of TII Publications document DN-GEO-03060, "*Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade separated, and compact grade separated junctions)*."

This assessment concludes that the current junction layout should be amended to bring the access junction in line with current TII standards. This can be achieved by amending the current road markings at the quarry access junction. Specifically, the following amendments are required to ensure the junction layout complies with the current TII Publication documents.

- 1) Nose length of 75 m with a ratio of 1:25 to be provided for the merge, and nose length of 70 m with a ratio of 1:15 to be provided for the diverge;
- 2) Auxiliary lane to be extended to 160 m for merge, and 150 m for diverge; and
- 3) Auxiliary Lane Taper to be extended to 75 m for merge, and 70 m for diverge.

However, due to the presence of an existing access to the east of the existing diverge lane, the full auxiliary lane and auxiliary lane taper is not feasible without conflicting with this access. It is therefore considered sufficient to retain the existing arrangement of the diverge at the quarry access. The merge should, however, be amended in line with the requirements listed above. Further design would be required prior to implementing the necessary road markings at this location.

Sightlines were assessed on the westbound on- and off-slip arrangements, and were found to be compliant with TII sightline requirements.

The assessment therefore indicates that the development will have a negligible impact on traffic flows on the existing road network due to the low volumes of traffic to be generated from it and, with the above amendments being implemented at the merge at the quarry access junction, the junction will accommodate existing and future traffic volumes for all future forecast years.

## 12.0 MATERIAL ASSETS

Material assets comprise the physical resources in the environment, which may be of human or natural origin. The objective of the assessment is to ensure that these assets will be used in a sustainable manner with respect to future operations at the Site.

Material Assets in the vicinity of the Site comprise of built services and infrastructure, such as:

- Electricity network utilities;
- Gas infrastructure;
- Telecommunications;
- Local water supplies and foul water network;
- Surface water drainage infrastructure;
- Waste management infrastructure; and
- Geological resource.

Other material assets include roads and traffic, which have been assessed in Chapter 11 (Traffic) and the potential effects of blasting and vibration on neighbouring dwellings (assessed in Chapter 8 (Noise and Vibration)).

Information for the assessment of potential impacts on the identified material assets was obtained by means of a desk-based review, and included the following sources:

- ESB network utility plans;
- Gas Networks Ireland utility plans;
- Eir CYBD mapping;
- Irish water utility mapping;
- Field surveys of the Application Site;
- Department of Communication, Climate Action and Environment (DCCA) Eircode maps; and
- Aerial and ordnance survey maps of the area.

### Impact Assessment and Mitigation Measures

#### *Electricity*

The Proposed Development will utilise electricity supplies to the Site via the existing onsite connection to the grid. The Proposed Development seeks to maintain existing connections and no new connections or demands on the electrical infrastructure are proposed. Further expansion of the existing pit is not proposed to the south-west in the area where the overhead 110KV line traverses the Site. Potential effects from the Proposed

Development's continuation of quarrying on the local electrical supply network are therefore considered to be imperceptible

### **Gas Supply**

There will be no requirements for a GNI connection to service the Development. Therefore, there will be no additional supply demands on the GNI network. Excavation and blasting works will take place on Site, however these activities will not be conducted in the vicinity of the distribution pipeline to the north of the Site between the boundary and the N7/M7. Effects from the Proposed Development's activities on the gas supply network are considered to be imperceptible.

### **Telecommunications**

The Site's office currently utilises a privately owned mast located to the south of the pit for telecommunications. The Proposed Development does not seek to access additional telecommunication infrastructure, nor does it seek to carry out extraction activities which may result in telecommunication infrastructure being affected. Effects from the Proposed Development's activities on the local telecommunication networks are considered to be imperceptible.

### **Local Water Supplies and Foul Water Infrastructure**

Water used on Site is abstracted from groundwater wells, and bottled water is used for drinking water. Additional abstraction points or access to the public water supply network are not required as part of the Proposed Development. As it is not proposed to consume water from the local supply network then potential effects from the Proposed Development on the water supply network are considered imperceptible.

Controlled blasting is conducted at the quarry as a method of rock extraction. As well as impacting local residents and their properties an improperly managed blast could damage the Irish Water pipeline located to the north of the quarry. Extraction in this area of the pit is proposed to be carried out in a phased manner in a northerly direction. To reduce the potential for damage to the Irish Water pipeline numerous mitigation measures are currently employed during blasts and these have been described in detail in Chapter 8 of the EIAR (Noise and Vibration). These measures include a number of operational controls and also the requirement for blasting contractors to be trained and competent. The blasting activity itself will be conducted using these existing blasting methods that are currently employed on Site. Further extraction methods and mitigation measures will be agreed in consultation with Irish Water prior to the commencement of extraction activities in the northern sections of the Site. With these embedded design and management measures it is considered that effects of Site activities on the Liffey aqueduct water main will be imperceptible.

### **Surface Water Drainage Infrastructure**

As noted, surface water on the Site infiltrates through the underlying soils and sub-soils and percolates to the groundwater. In addition, as part of the water management system on the Site, water abstracted from the western quarry pit is periodically discharged intermittently following periods of prolonged rainfall to a culvert located on the northern portion of the Site adjacent to the N7/M7 roadway. Water from this culvert is discharged into the roadway drainage system. Discharged water does not come into contact with 'dirty' water from the washing plant.

It is considered that these discharges have resulted in a negligible impact on the network resulting in effects that are capable of measurement but without significant consequences (imperceptible).

### **Waste Management Infrastructure**

The proposed continuation in quarrying activities will not generate any new waste streams or additional quantities of wastes. Current waste management practices will be maintained, and waste will be managed by

suitable qualified, permitted and licenced operators. It is considered that the effects on the local waste infrastructure will be imperceptible.

**Geology as an Economic Resource**

The Proposed Development will result in a permanent loss of the geological resource within the confines of the Site. This extraction of aggregate is considered an acceptable use of the resources at the Site and material extracted from the Proposed Development will be used as raw material in the construction industry. Therefore, potential impacts from the Proposed Development’s extraction of the geological resources and economic use is considered to be low (beneficial) resulting in effects that are slight.

**13.0 INTERACTIONS**

This assessment summarises the primary interactions and inter-relationships and provides a matrix to coherently display the interactions of these disciplines. The overall objective of this assessment is to identify whether additional mitigation is required that would not otherwise have been identified in the individual study areas for these interacting or cumulative effects.

Interactions of EIA study topic areas are typically displayed visually in a matrix table which identifies potential interactions which are likely to occur between the various disciplines. This table, from Chapter 13 of the EIAR, has been reproduced in Table 1. Green shaded boxes identify the potential interacting disciplines where a relationship exists, and the respective phase where there is an interaction is also indicated.

**Table 1: Behan Quarry EIAR Environmental Interactions.**

	Pop. & Human Health	Ecology & Biodiversity	Land, Soils & Geology	Water	Air Quality & Climate	Noise & Vibration	Cultural Heritage	Traffic & Transport	Landscape & Visual	Material Assets
Pop. & Human Health										
Ecology & Biodiversity										
Land, Soils & Geology										
Water										
Air Quality & Climate										
Noise & Vibration										
Cultural Heritage										
Traffic & Transport										
Landscape & Visual										
Material Assets										

**14.0 MITIGATION AND MONITORING MEASURES**

The purpose of this Section is to collate the mitigation and monitoring measures identified in the EIAR that are considered necessary to protect the environment during operational and restoration phases of the Proposed Development.

Where appropriate, environmental monitoring activities have been proposed for the operational and restoration phases. Monitoring is ongoing and will take place after the consent is granted for the Proposed Development

to provide assurance that aspects of the design and management are functioning as intended and therefore not generating significant effects.



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