

CHAPTER 4

POPULATION AND HUMAN HEALTH

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INTRODUCTION

- 4.1 This chapter of the Environmental Impact Assessment Report (EIAR) relates to the potential effects of the recommencement / deepening of the existing quarry and recommencement of aggregate processing activities at Aghamore Near, Aghamore Far and Carrownamaddoo townlands in Co. Sligo on population and human health.
- 4.2 For further details of the proposed development and the application site context, refer to chapters 1 and 2 of this EIAR.

Scope of Work

- 4.3 The EPA guidelines in relation to the preparation of EIAR¹ note the following in respect of population and human health:
- assessment of land-use planning and demographic issues or detailed socio-economic analysis is not generally required;
 - economic development or settlement patterns are only relevant if they give rise to new development and associated effects;
 - human health should be considered in the context of the relevant environmental topics addressed by the EIAR;
 - the effects on human health via relevant pathways (such as air, soil and water) should be considered in the context of accepted standards for exposure, dose or risk;
 - other health and safety issues are addressed under other EU directives.
- 4.4 On the basis of the guidelines, the scope of this chapter of the EIAR is limited to a consideration of population, employment, amenity and human health in the context of the topics addressed by this EIAR.

Consultations / Consultees

- 4.5 Consultation was not undertaken in the preparation of this chapter of the EIAR.

Contributors / Author(s)

- 4.6 This chapter of the EIAR was prepared by Peter Kinghan, who is a Technical Director with SLR Consulting Ireland. Peter is a Chartered Mineral Surveyor and has worked previously on several extractive industry planning applications and EIARs.

Limitations / Difficulties Encountered

- 4.7 No limitations or difficulties were encountered in the preparation of this chapter of the EIAR.

¹ Environmental Protection Agency (2017). *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*. Draft dated May 2017. Environmental Protection Agency, Johnstown Castle Estate, Co. Wexford.

REGULATORY BACKGROUND

Legislation

4.8 There is no specific legislation relevant to this chapter of the EIAR. Legislation, if any, that is relevant to each pathway (noise, air, soil, water, etc.) is addressed elsewhere in this EIAR.

Planning Policy and Development Control

- 4.9 The current county development plan is Sligo County Development Plan 2017 – 2023.
- 4.10 The application site is within an area covered by the Sligo & Environs Development Plan 2010-2016. Appendix A to the Sligo County Development Plan 2017-2023 states that the written statement and the objectives maps, including zoning objectives, pertaining to the Sligo & Environs Development Plan 2010-2016, have been appended to the County Development Plan.
- 4.11 The majority of the application area is assigned the land-use zoning ‘NR – natural/mineral resource reservation’ within the Sligo & Environs Plan, and part of the site is assigned the land-use zoning ‘BUF – buffer zone’.
- 4.12 Section 6.8 of the appended Sligo & Environs Plan also addresses mineral extraction and natural resources and includes specific objective (O-NR-1) to protect the natural resource reservation and existing quarrying operations at Aghamore Near, Aghamore Far and Carrownamadoo.
- 4.13 The County Development Plan sets out the settlement strategy and policies for the sustainable development of Sligo.
- 4.14 Section 4.3.4 of the county development plan relates specifically to mineral extraction and quarries. It states that Sligo County Council recognises the importance of the aggregate and concrete products industry to the economy, employment and the provision of essential construction materials. The following policies apply:
- P-MEQ-1 Protect all known unworked deposits from development that might limit their scope for extraction (e.g. one-off housing)
 - P-MEQ-2 Ensure that extraction and associated processes are carried out in a sustainable manner, which minimises the impact on residential amenities, natural environment and water quality, and do not impinge on existing rights-of-way or walking routes.
 - P-MEQ-3 Seek the reuse of worked out quarries for recreational, industrial, ecological and other uses, following appropriate restoration.
 - P-MEQ-4 In respect of development proposals on or in the proximity of quarry sites, the Council will require that appropriate investigations are carried out into the nature and extent of old quarries (where applicable), the nature and extent of soil and groundwater contamination and the risks associated with site development works. Adequate measures to mitigate these risks shall be submitted as part of the planning application.
- 4.15 Policy P-RDD 1 generally seeks to facilitate resource based rural enterprise. The county development plan also includes policies that seek to maintain water quality in accordance with the requirements of the Water Framework Directive (P-WQ-1 and P-WQ-4), ensure that existing and new development does not contribute to a deterioration in air quality (P-AQ-2) and ensure that proposals with the potential to generate noise will protect the amenity of noise sensitive developments by incorporating appropriate measures (P-CN-1).

Guidelines

- 4.16 As outlined above, this chapter of the EIAR has been prepared on the basis of the draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports by the EPA (2017).

Technical Standards

- 4.17 There are no technical standards relevant to this chapter of the EIAR. Technical standards, if any, that are relevant to each pathway (noise, air, soil, water, etc.) are addressed elsewhere in this EIAR.

RECEIVING ENVIRONMENT

Study Area

- 4.18 The study area relates to the vicinity of the application site and to those dwellings and buildings on the roads surrounding the application site.

Baseline Study Methodology

- 4.19 The baseline study comprises a desk-top review of online and published resources, information provided by the applicant and information contained in the other chapters of this EIAR. A review of existing residential housing and sensitive receptors in the vicinity of the application site was undertaken. Ordnance Survey maps and aerial photography were also examined.

Sources of Information

- 4.20 Baseline information was obtained from the following sources:
- Myplan.ie (<http://myplan.ie/index.html>);
 - Historic Environment Viewer (<http://webgis.archaeology.ie/historicenvironment/>);
 - Sligo County Development Plan 2017;
 - The environmental topic chapters of this EIAR;
 - OSi Maps;
 - Aerial Photographs;
 - Openstreetmap.org;
 - Live Register Statistics;
 - Census 2016.

Context

- 4.21 The application site is located south of Sligo town, off the R287 regional road in the town lands of Aghamore Near, Aghamore Far and Carrownamaddoo. Although there is a dispersed pattern of housing development in the vicinity, there is no distinctive village or settlement in the immediate vicinity.

- 4.22 The quarry area on the western side of the local road that bisects the application site is bounded on all sides by agricultural land and there are a number of dwellings located along the roads in the vicinity. The processing area located on the eastern side of the road is bounded by agricultural lands to the East, and industrial land uses to the North and South. There is a sports ground located to the northwest of the application area. The site is accessed from a local road (L3603). Lough Gill is located c. 360m north-east of the application site.
- 4.23 Existing facilities at the site include the weighbridge & weighbridge office and a garage / workshop. These facilities are located within the processing area on the eastern part of the application site. There is an existing asphalt production plant located adjacent to the aggregate processing area.
- 4.24 The planning application includes the following:
- The provision of a settlement lagoon (c. 2,800m²);
 - The provision of 2 no. wheelwashes;
 - The Provision of a double stacked portacabin office;
 - The Provision of a wastewater treatment system;
 - Additional stockproof / trespass proof boundary fencing;

Environmental and Heritage Designations

- 4.25 There are seven Natura 2000 sites within 5 km of the boundary of the application area. Lough Gill SAC (Site code 001976) is 360 metres north east from the access track to the Processing Area, or 780 metres north east of the Quarry Area. Ballysadare Bay SAC (Site code 000622) and SPA (Site code 004129) are approximately 3.3 km south west of the site, while the Unshin River SAC (Site code 001898) is approximately 3.7 km south west of the Site. Union Wood SAC (Site code 000638) is approximately 2.79 km south of the Site. Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC (Site code 000627) and Cummeen Strand SPA (Site code 004035) are approximately 4.41 km north and west of the Site at Aghamore.
- 4.26 The Record of Monuments and Places includes the following recorded monuments within and in the vicinity of the application area:
- Ref. SL020-094 – A hachured enclosure located on the access road into the application area. This record is noted as having been removed by quarrying;
 - Ref. SL020-093 – A ringfort or rath;
 - Ref. SL020-086 – A ringfort or rath.
- There are no recorded monuments within the application area.
- 4.27 There are no buildings on the National Inventory of Architectural Heritage in the vicinity. According to the OPW model, part of the quarry void is noted as being at risk of pluvial flooding and all of the void is at risk of coastal flooding.

Population

- 4.28 The review of population is based on the electoral divisions of Ballintogher West and Calry, in which the application site is located. The change in population from 2011 to 2016, as per Census 2016² for the electoral divisions, the county, the province and the state is outlined in the table below.

Table 4-1
Population 2011 - 2016

	2011	2016	% Change
Ballintogher West ED	435	443	1.8%
Calry	1,806	1,702	-5.8%
County Sligo	65,393	65,535	0.2%
Connacht	542,547	550,668	1.5%
Ireland	4,588,252	4,757,976	3.7%

- 4.29 The census results indicate that population growth in Ballintogher West, Sligo and Connacht, is significantly slower than at the national level and the population is in decline in Calry electoral division.

Employment

- 4.30 According the August 2017 Live Register statistics³, there were 3,160 persons in Sligo town on the live register. This figure has dropped from 3,724 in August 2016 and 4,009 in August 2015. Notwithstanding the downward trend, the current figure remains high compared to the August 2006 figure of 1,735. The current figure of 3,160 is an 82% increase on the August 2006 figure.
- 4.31 The application area is located in the electoral divisions of Ballintogher West and Calry.
- 4.32 According to the 2016 census results⁴, Ballintogher West has a total population of 443. Of the 371 people aged 15 years or older, some 217 were at work, 3 were looking for their first job and 14 were unemployed. Others were students, working at home, retired, unable to work or other.

² <http://census.cso.ie/sapmap/>

³ <http://www.cso.ie/px/pxeirestat/Statire/SelectVarVal/Define.asp?Maintable=LRM07&Planguage=0>

⁴

http://census.cso.ie/sapmap2016/Results.aspx?Geog_Type=ED3409&Geog_Code=2AE196291A2613A3E055000000000001

- 4.33 According to the 2016 census results⁵, Calry has a total population of 1,702. Of the 1,433 people aged 15 years or older, some 719 were at work, 17 were looking for their first job and 51 were unemployed. Others were students, working at home, retired, unable to work or other.
- 4.34 The population in Ballintogher West and Calry and Sligo is categorised by occupation as per table 4.2. This shows that the trend in Ballintogher West and Calry is broadly similarly to that in the wider county, albeit that a higher proportion of people are engaged in managerial, professions and administrative and secretarial occupations in Calry than in Sligo and a higher proportion of people are engaged in technical and skilled occupations in Ballintogher West than in Sligo.

Table 4-2
Population of Ballintogher West and Calry by Occupation

Occupation	Ballintogher West		Calry		County Sligo	
	No.	%	No.	%	No.	%
Managers, Directors and Senior Officials	8	3.46	76	9.87	1,927	6.46
Professional Occupations	35	15.15	193	25.07	5,151	17.28
Associate Professional and Technical Occupations	32	13.85	95	12.34	2,911	9.76
Administrative and Secretarial Occupations	21	9.09	88	11.43	3,034	10.18
Skilled Trades Occupations	46	19.91	86	11.17	5,049	16.93
Caring, Leisure and Other Service Occupations	25	10.82	60	7.79	2,671	8.96
Sales and Customer Service Occupations	17	7.36	37	4.81	1,816	6.09
Process, Plant and Machine Operatives	14	6.06	40	5.2	2,087	7.00
Elementary Occupations	17	7.36	64	8.31	2,563	8.60
Not stated	16	6.93	31	4.03	2,605	8.74

5

http://census.cso.ie/sapmap2016/Results.aspx?Geog_Type=ED3409&Geog_Code=2AE1962919A913A3E05500000000001#SAPMAP_T8_801

Total	231	100	770	100	29,814	100.00
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4.35 A breakdown of the industry in which those at work are employed is provided below as per table 4.3. This shows that:

- a higher proportion of the population in Ballintogher West is likely to be engaged in building and construction, commerce and trade, transport and communications, and professional services than in Sligo and that a lower proportion is engaged in agriculture, forestry and fishing, manufacturing and public administration than in Sligo;
- a higher proportion of the population in Calry is likely to be engaged in commerce and trade, transport and communications, public administration and professional services than in Sligo and that a lower proportion is engaged in agriculture, forestry and fishing, building and construction and manufacturing than in Sligo.

Table 4-3
Persons at work in Ballintogher West and Calry by industry

Industry	Ballintogher West		Calry		County Sligo	
	No.	%	No.	%	No.	%
Agriculture, forestry and fishing	12	5.53	27	3.76	1,868	7.18
Building and construction	22	10.14	27	3.76	1,165	4.48
Manufacturing industries	21	9.68	73	10.15	3,262	12.55
Commerce and trade	46	21.2	137	19.05	4,894	18.82
Transport and communications	17	7.83	34	4.73	1,224	4.71
Public administration	12	5.53	66	9.18	1,952	7.51
Professional services	64	29.5	244	33.94	7,203	27.70
Other	23	10.6	111	15.44	4,434	17.05
Total	217	100	719	100	26,002	100

Sensitive Receptors

4.36 The application site is located in a rural area, but the nearby roads and in particular the roads to the north-east and north-west display a pattern of ribbon development. There is a more dispersed pattern of residential development along the local road to the south of the site north. There are a number of industrial and commercial developments to the south-east of the site associated with the manufacturing area of the site and the nearby business park.

- 4.37 The closest residential dwelling to the development area is located approx. 105 metres to the south of the access road of the quarry area. There are no residences within 150 metres of the quarry void.
- 4.38 There are no schools, churches or shops in the vicinity. The St John's Football Club is located to the north-west of the application site.
- 4.39 Figure 4.1 identifies residential properties, community facilities and commercial operations within the locality and shows 500m and 1km bands from the application boundary.

IMPACT ASSESSMENT

Evaluation Methodology

- 4.40 The evaluation of effects on employment, human health and amenity comprises a qualitative assessment based on the quantitative and qualitative analysis of potential effects on the environment undertaken in other chapters of this EIAR. The assessment also takes into account a review of relevant literature and professional judgement in relation to impact on population and human health.

Employment

Operational Stage Impacts

- 4.41 The proposed development will provide employment of up to 6 people directly on-site, in addition to a number of indirect employees including hauliers, sub-contractors, materials suppliers and maintenance contractors. In addition, the proposed development will contribute indirectly to sustaining and developing the local and regional economy through continued supply of construction aggregates.
- 4.42 This is a medium-term and positive impact that would not have significant effects on the environment.

Post – Operational Stage Impacts

- 4.43 Following the cessation of operations, the application site will be restored to natural habitat. This would result in the loss of jobs within the quarry and related operations. Some short-term employment would be provided in relation to the aftercare of the restored site – refer to Figure 2.2.

Human Health

- 4.44 The key pathways in relation to human health in this instance are air, noise, water and soil.

Construction / Operational Stage Impacts

- 4.45 The construction and operational phase of the development relates to the construction of the settlement lagoon, berm, wheelwashes & portacabin along with extraction and primary processing of aggregates within the quarry area using conventional quarrying techniques, secondary

processing of aggregates in the processing area to the east of application site and the restoration of the quarry to natural habitat after-uses. This stage of operations has the potential to generate impacts that would have effects on human health through the pathways of noise, vibration, dust, soil and water.

- 4.46 As outlined in chapter 6 regarding land, soils and geology, chapter 7 regarding water, chapter 8 regarding air and chapter 10 regarding noise & vibration, a number of mitigation measures are proposed, and the residual effect of the proposed development is predicted to be negligible to acceptable.
- 4.47 On this basis, it is considered that there would be no likely significant temporary or permanent effects on human health during the construction and operational stage following mitigation.

Post – Operational Stage Impacts

- 4.48 Following restoration, the potential effects on noise, vibration, dust, soil and water would cease owing to the cessation of quarrying operations and restoration operations.
- 4.49 As outlined in chapters 6 (land, soils and geology), 7 (water), 8 (air) and 9 (noise and vibration) mitigation measures are proposed. Based on the proposed mitigation measures, the potential for residual effects is predicted to be negligible. On this basis, it is considered that there would be no likely significant effect on human health during the post-operational stage.

Amenity

- 4.50 The key matters in relation to amenity in this instance are noise, vibration, dust, water., landscape and traffic.

Construction / Operational Stage Impacts

- 4.51 The construction & operational phase would require the extraction of aggregates, which has the potential to generate impacts that would have effects on amenity through the pathways of noise, vibration, dust and water. In addition, there would be vehicle movements associated with the quarry.
- 4.52 As outlined in chapters 7 (water), 8 (air), 10 (noise and vibrations), 13 (landscape) and 14 (traffic), mitigation measures are proposed. Based on the proposed mitigation measures, the potential for residual effects during the construction and operational phase is likely to be negligible to acceptable. On this basis, it is considered that there would be no likely significant effect on amenity during the operational stage.

Post – Operational Stage Impacts

- 4.53 Following restoration, the potential effects on water, air, noise, vibration, and traffic would cease owing to the cessation of quarrying and restoration operations, the cessation of machinery operation and the growth of vegetation.
- 4.54 Clearly, following the cessation of the proposed works, the appearance of the application site will have altered as the site is restored. As outlined in chapter 13 relating to landscape, the effects of the restored development would be beneficial compared to the current baseline.

- 4.55 Based on the anticipated outcomes of the proposed development, the potential for residual effects during the post-operational phase is likely to be low. On this basis, it is considered that there would be no likely significant effect on amenity during the post-operational stage.

Unplanned Events

- 4.56 According to the EPA guidelines, unplanned events, such as accidents, can include “*spill from traffic accidents, floods or land-slides affecting the site, fire, collapse or equipment failure on the site*”. The 2014 EIA directive refers to “*major accidents, and/or natural disasters (such as flooding, sea level rise, or earthquakes)*”.
- 4.57 In this instance, the vulnerability of the proposed development to accidents, unplanned events or natural disasters is relatively limited owing to the relatively simple nature of the development works, the established nature of the techniques, regulations and procedures to be followed, the material to be handled on site and the relatively rural location of the proposed works.
- 4.58 Unplanned events in relation to the proposed development could potentially relate to:
- instability following the extraction of rock;
 - spill from traffic accidents;
 - flooding.
- 4.59 Adhering to the HSA Safe Quarry Guidelines to the Safety Health and Welfare at Work (Quarries) Regulations 2008 should limit the potential for unplanned events in the form of instability in the quarry faces. In any event, instability following the extraction of rock would be unlikely to have any significant impacts on employment, human health or amenity, particularly beyond the site. The final restoration will provide for the restoration of the quarry to a mixture of natural habitat, a water body, naturally regenerating quarry benches and woodland.
- 4.60 Chapter 7 (water) notes that spillages of fuels or chemicals during site activities could happen without proper control and supervision. Discharged water off-site could potentially breach water quality limits without monitoring. Pump failure in the quarry could result in the quarry floor flooding leading to the potential for groundwater pollution by plant and equipment; uncontrolled discharge of water to the Aghamore Stream could potentially lead to localised flooding off-site in the worst case. Appropriate mitigation measures and monitoring have been proposed to ensure that there are no potential impacts on the water environment as a result of unplanned events at the site.
- 4.61 The traffic and transport assessment, carried out as part of the EIAR (Chapter 14), indicates that existing road network can accommodate the proposed development. Chapter 14 also recommends the erection of warning signage and the improvement of sightlines at the entrance to the application area. It is considered that the risk of an accident resulting in a spillage would be no greater in relation to this development than it is for any other form of development that relies on the transportation of goods and materials by HGVs. The potential for significant impacts on employment, human health in the wider population or amenity as a result of a road spillage is likely to be low and any such effects would be temporary.

Cumulative / Synergistic Impacts

- 4.62 A search of the Sligo County Council online planning search facility indicates that there are no other planned developments in the vicinity of the application site and in the adjoining townlands of Carrownamaddoo, Cuilbeg, Aghamore Near, Tullynagracken South, Drumiskabole, Ballydawley,

Castledargan, which were granted planning permission in the last five years⁶ and have the potential to have any significant adverse cumulative impacts on the local environment. It is noted that planning permission has recently been granted for development consisting of the filling of lands with construction and demolition waste in Carrownamaddoo townland c. 450 metres from the application area (Plan File Ref. No. 18/49) subject to 7 no. conditions. This proposed development is considered small scale, short term in duration (5 years) and is located sufficient distance from the application area and therefore no cumulative impacts are considered.

- 4.63 It is considered that the only impact that has the potential for significant cumulative impact on population and human health and in particular on amenity is traffic. The traffic impact of the proposed development, along with cumulative impact from the existing asphalt plant, is assessed and discussed in chapter 14 of this EIAR. The assessment concludes that the relevant junctions and links will have sufficient capacity for the traffic generated by the quarry development.

Transboundary Impacts

- 4.64 It is not anticipated that the impacts of the proposed development would have any significant transboundary effects on population and human health.

Interaction with Other Impacts

- 4.65 It is not anticipated that the effects of the proposed development on population and human health would interact significantly with other impacts.

‘Do-nothing Scenario’

- 4.66 If planning permission is not approved for the proposed recommencement of quarry operations, the site would be restored in accordance with the permitted restoration scheme. This would result in a cessation of impacts related to noise, air, dust, water, vibration and traffic. This would also result in an adverse effect on employment, because the workforce that would have otherwise been employed by the quarry would not exist.

MITIGATION MEASURES

Operational Stage

- 4.67 Mitigation measures to be adopted in relation to population and human health during the operational stage will relate to minimising the effect of the development on surrounding sensitive receptors in relation to air, noise, water, soil, traffic and landscape. These measures relate primarily to avoidance, prevention and reduction and are discussed in the relevant chapters of the EIAR.
- 4.68 These mitigation measures include the following:

⁶ Planning search conducted on 21st April 2021 on Sligo County Council website.

Table 4-5
Construction & Operational Stage Mitigation Measures

Topic	Mitigation Measure
Soil	<p>In order to limit the effects of erosion on any existing excavated soil material from the proposed settlement lagoon the following mitigation measures will be used on site during handling:</p> <ul style="list-style-type: none"> • Soil material will be placed in permanent or temporary locations at a safe angle of repose; • Screening berms will be re-vegetated where they are in place for a sufficient length of time to justify such measures; and • The re-handling of soil material will be minimised as much as possible in order to preserve the integrity of the soil material; this is also an economically prudent practice.
Water	<ul style="list-style-type: none"> • Groundwater monitoring of installed monitoring wells; • All petroleum-based products (lubricating oils, waste oils, etc.) will be stored in a bunded area to prevent pollution by accidental leaks; • All plant used on site will be inspected regularly for signs of leaks. Mobile plant will only be serviced on a hardstand refuelling area draining to an interceptor to prevent uncontrolled releases of pollutants to ground (refer to Figure 2.1 for proposed location). No refuelling or servicing of mobile plant will be undertaken within the quarry void. Where refuelling of semi-mobile plant and machinery is required (e.g. crushers and screeners within the quarry void) spill kits and drip trays will be provided.; • Spill kits will be maintained on site to prevent the migration of any accidental spillages, should they occur; • Oil interceptors and separators shall be fitted, with the capacity to deal with the 2020 licensed discharge volume of 3,500m³/d [DL(W)151]. • A settlement lagoon will be installed to reduce suspended solids levels in the discharges; • No pumping will occur during flooding events which eliminates the slight risk from flooding during extreme events.
Dust	<ul style="list-style-type: none"> • Minimise drop heights when handling materials. Avoid working in adverse/ windy conditions. • Minimise drop heights when handling material, protection from wind where possible. Use of water sprays / tractor & bowser to moisten surfaces during dry weather. • Minimise distances of onsite haul routes. • Restrict vehicle speeds through signage / staff training. • Location of haul routes away from sensitive receptors. • Use of road sweeper to reduce the amount of available material for re-suspension. • Used of paved access roads.

Topic	Mitigation Measure
	<ul style="list-style-type: none"> • Avoid working in adverse weather conditions. • Limit mechanical disturbance. • Retention of hedgerows • Retention of perimeter berms
Noise	<ul style="list-style-type: none"> • Existing screening berms and screen planting shall be retained to act as acoustic barriers. Berms will be inspected on a regular basis and maintained as necessary. • Plant:- <ul style="list-style-type: none"> ○ all mobile plant used at the development will have noise emission levels that comply with the limiting levels defined in EC Directive 86/662/EEC and any subsequent amendments; ○ all plant items will be properly maintained and operated according to the manufacturers' recommendations, in such a manner as to avoid causing excessive noise (i.e. all moving parts are kept well lubricated, all cutting edges are kept sharpened, the integrity of silencers and acoustic hoods are maintained); ○ all plant will be subject to regular maintenance, i.e. all moving parts are kept well lubricated, all cutting edges are kept sharpened, the integrity of silencers and acoustic hoods are maintained; ○ all plant will be fitted with effective exhaust silencers which are maintained in good working order to meet manufacturers' noise rating levels. Any defective silencers will be replaced immediately. • Traffic:- <ul style="list-style-type: none"> ○ any deliveries will be programmed to arrive during daytime hours only; ○ care will be taken when unloading vehicles to reduce or minimise potential disturbance to local residents. ○ access / internal haul roads will be kept clean and maintained in a good state of repair, i.e. any potholes filled and large bumps removed, to avoid unwanted rattle and "body-slap" from heavy goods vehicles; ○ vehicles waiting within the quarry will be prohibited from leaving their engines running and there should be no unnecessary revving of engines.
Vibration	<ul style="list-style-type: none"> • Blast notifications will be provided by advance notification to all residences located within 500 metres of the site. • All blasting operations will be carried out by a certified 'shotfirer' in accordance with the relevant health and safety regulations.

Topic	Mitigation Measure
	<ul style="list-style-type: none"> The optimum blast ratio will be maintained and the maximum instantaneous charge is optimised. To avoid any risk of damage to properties in the vicinity of the site, the groundborne vibration levels from blasting will not exceed a peak particle velocity of 12 mm/sec.
Traffic	<p>The erection of warning signage on the approach roads.</p> <p>The improvement of sightlines at the quarry entrance.</p>
Landscape	<p>Hedgerow and woodland planting using native species is proposed along the boundaries of the application area which, along with vegetation to be retained would mitigate landscape and visual effects.</p> <p>The post operational stage mitigation comprises a restoration plan to be implemented at the end of the life of the quarry. The restoration plan includes a range of measures to restore the quarry site to an afteruse which would be more sympathetic with the surrounding landscape. Details of the restoration plan are presented in Figure 2.2.</p>

Post – Operational Stage

4.69 The majority of effects of the proposed development will diminish or cease following the cessation of operations. No specific mitigation measures are proposed in relation to the post operational phase.

RESIDUAL IMPACT ASSESSMENT

Operational Stage

4.70 As outlined in chapters 6 (land, soils and geology), 7 (water), 8 (air), 10 (noise and vibration), 13 (landscape) and 14 (traffic) of this EIAR, the mitigation measures would successfully reduce the effects of the proposed development during the operational phase as follows:

- Land, Soils and Geology: None
- Water: None
- Dust: Insignificant to Acceptable
- Noise: Negligible to Minor
- Vibration: None
- Traffic: The assessments have concluded that the links and junctions will operate within capacity for each of the assessment years.
- Landscape: Very small and beneficial

4.71 No specific mitigation measures are proposed in relation to human health and population.

Post – Operational Stage

- 4.72 As outlined in chapters 6 (land, soils and geology), 7 (water), 8 (air), 10 (noise and vibration), 13 (landscape) and 14 (traffic) of this EIAR, the mitigation measures would successfully reduce the effects of the proposed development during the post operational phase as follows:
- Land, Soils and Geology: None
 - Water: None
 - Dust: Insignificant to Acceptable
 - Noise: Negligible to Minor
 - Vibration: None
 - Traffic: None – all associated traffic will cease.
 - Landscape: Beneficial following restoration when compared with the existing baseline.
- 4.73 No specific mitigation measures are proposed in relation to human health and population.

MONITORING

- 4.74 As outlined in chapters 2 (description of the development), 7 (water), 8 (air) and 10 (noise and vibration), monitoring in relation to the proposed development will be undertaken in respect of water, noise, air and vibrations. On this basis, no specific monitoring is required in relation to population and human health

Environmental Monitoring Programme

- 4.75 When previously operational the site had an established environmental monitoring programme—refer to Condition No. 22 imposed under Plan File Ref. No. PL02/271 and Appendix 2-3. Water, noise, dust and blast monitoring was carried out on a regular basis (when operational), to demonstrate that the development was not having an adverse impact on the surrounding environment and could operate within the permitted environmental emission limit values.

Water

- 4.76 All surface water monitoring required under the existing Trade Effluent Discharge Licence is currently being carried out. Flowmeters are already installed in the discharge pipes from the quarry sump and a flowmeter installed upstream of the quarry discharge to the Aghamore Stream.
- 4.77 Groundwater levels will be monitored in the existing monitoring wells as the quarry is developed to confirm the drawdown and estimated radius of influence. Monitoring of groundwater levels by datalogger with periodic site visits to download data will be required.
- 4.78 Groundwater quality monitoring will continue to be carried out on a biannual basis from a representative number of monitoring wells around the quarry.
- 4.79 Water levels at Culvert 4 (by the entrance of the Top Coast Oil depot) will be monitored during periods of high rainfall to assess the likelihood of flooding onto the adjacent road. As noted above, discharges will be discontinued during periods of elevated rainfall to eliminate the slight potential risk at this location.

Dust and Air

- 4.80 Dust deposition monitoring will be carried out at the application site. Dust monitoring locations shall be reviewed and revised where necessary. The results of the dust monitoring will be submitted to Sligo County Council on a regular basis for review and record purposes.

Noise

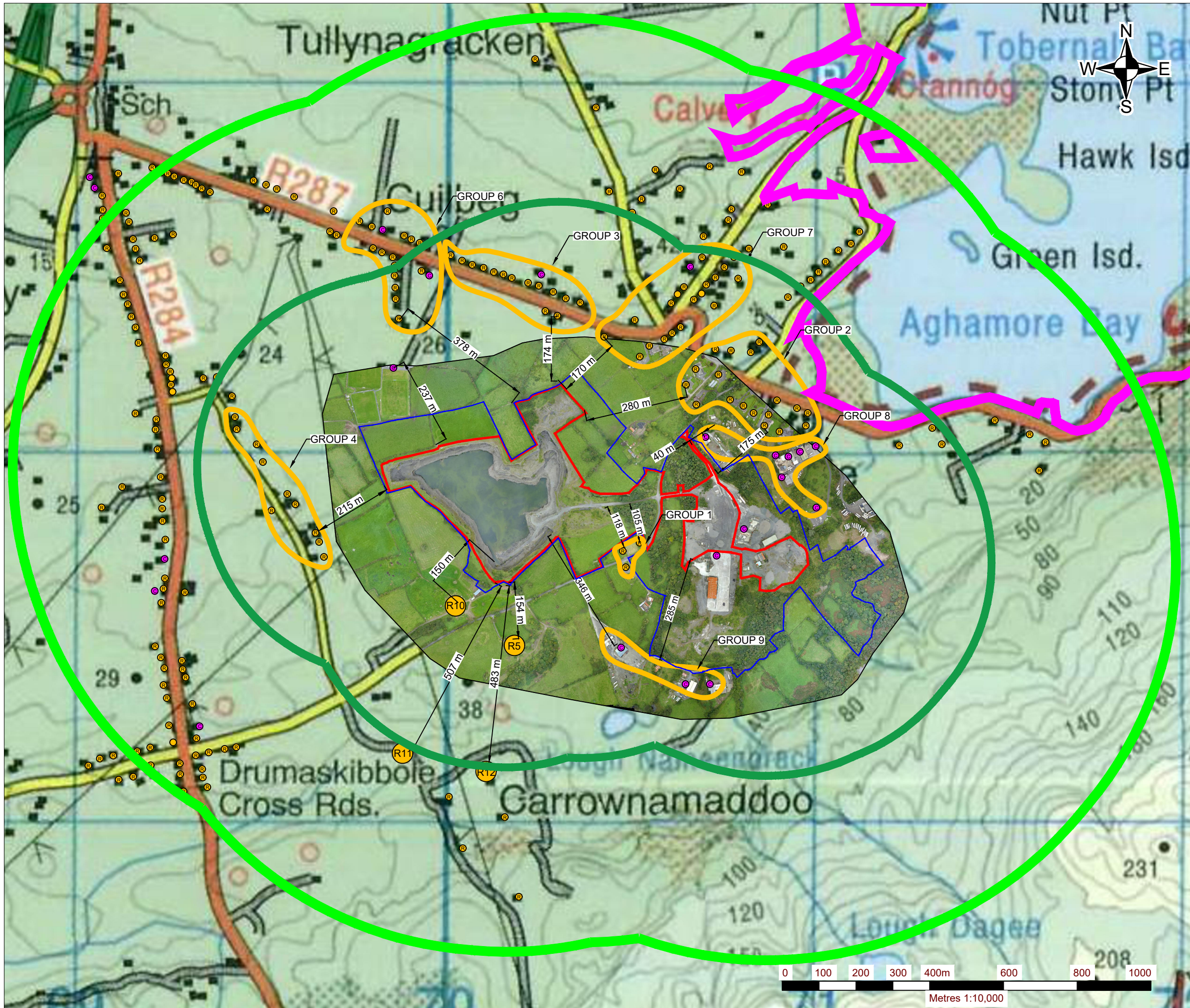
- 4.81 Noise monitoring will be undertaken at the application site. Noise monitoring locations shall be reviewed and revised where necessary. The results of the noise monitoring will be submitted to Sligo County Council on a regular basis for review and record purposes.

Vibration

- 4.82 Monitoring of blasts (both for groundborne vibration and air overpressure) will be carried out at the site. The blast monitoring results will be submitted on a regular basis to Sligo County Council for record purposes.

FIGURES

Figure 4-1: Residences, Community Facilities and Commercial Operations



NOTES

1. ORDNANCE SURVEY IRELAND LICENCE NO. CYAL50167032 (C) ORDNANCE SURVEY IRELAND / GOVERNMENT OF IRELAND
2. AERIAL PHOTOGRAPHY CARRIED OUT BY SLR CONSULTING SEPTEMBER 2020

LEGEND

	APPLICATION AREA
	RESIDENCE
	COMMERCIAL
	1 KM OFFSET
	500 M OFFSET
	GROUPS OF RECEPTORS
	LOUGH GILL SAC

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 CARROWNAMADDOO TOWNLANDS, CO. SLIGO

LOCAL RECEPTORS

FIGURE 4.1

Scale 1:10,000 @ A3 Date MAY 2021

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