



Ballysheedy Quarry,  
Gort, Co. Galway  
Substitute Consent Application



Remedial  
Natura Impact Statement

May 2022

## Ballysheedy Quarry, Gort

### Appropriate Assessment Screening and rNIS Report

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Remedial Natura Impact Statement

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## 1 INTRODUCTION

This Natura Impact Assessment (hereafter referred to as 'NIS') has been prepared to accompany a Substitute Consent Planning Application to An Bord Pleanála for the Substitute Consent at Ballysheedy Quarry.

Ballysheedy Quarry is located in a primarily agricultural area within the townland of Ballysheedy, approximately 2.8 km south west of the settlement of Gort, County Galway and located west on the M18 (National Galway-Ennis Road) between Crusheen and Gort.

Ballysheedy Quarry is a limestone quarry owned by John Madden & Sons Ltd. The quarry was operated by Higgins (1994 – 2000) and Goode Concrete (2000 to 2012). The overall quarry in Madden ownership is approximately 12.69ha in area and the operations on the site include three previous permissions for limestone extraction. There are also administration offices, toilets, weighbridge, wheelwash and reception office outside of the application area, to the east of overall quarry. The Substitute consent (SC) area is in the ownership of John Madden & Sons Ltd as well as part of the granted quarry to the east (total 12.69ha).

The quarry has been in operation since the 1994 and was granted planning permission by Galway County Council in 1994. There have been a number of planning permissions for additional quarrying activities and operations at this location since 1994. These are detailed in the Planning Section of this remedial Environmental Impact Assessment Report (rEiAR). The quarry was registered under Section 261 of the Planning & Development Act 2000; Reference QY /46.

The location of the site in relation to its geographic surrounds is shown on Figure 1 'Regional Site Location Map'. The purpose of this Natura Impact Statement is to inform the Appropriate Assessment process which is carried out by the appropriate Planning Authority.

The application red-line boundary is illustrated in DWG No. 10925-3001B. (Figure 2 below.) The redline delineates the area of the Substitute Consent application. The blue line delineates the adjoining land in the control of the applicant (existing quarry). The blue hatched area represents Additional Areas proposed to be reserved and for access. The Green line indicates the Planning Boundary of the 2009 quarry area permitted under Pl. Ref. No. 09/415, as extended under 15/724, i.e. part of the green line planning boundary is outside the ownership of John Maddens and Sons Ltd.

## 2 THE APPROPRIATE ASSESSMENT PROCESS

The AA process is an assessment of the potential for likely significant effects or negative effects of a plan or project, alone and/or in-combination with other plans or projects, on the conservation objectives of a European site(s). The Natura 2000 network is made up of European sites including Special Protection Areas (SPAs), established under the EU Birds Directive (2009/147/EC) (more generally referred to as the 'Birds Directive') and Special Areas of Conservation (SACs), established under the EU Habitats Directive (92/43/EEC) (more generally referred to as the 'Habitats Directive'). The Natura 2000 network helps provide for the protection and long-term survival of Europe's most valuable and threatened species and habitats.

The Screening Stage of the AA process identifies any likely significant effects upon European sites from the development alone or in-combination with other projects or plans. A series of questions are asked during the Screening Stage of the AA process to determine:

- whether a plan or project can be excluded from AA requirements because it is directly connected with or necessary to the management of a European site; and
- whether the project or plan will have a potentially significant effect on a European site, either alone or in-combination with other projects or plans, in view of the site's conservation objectives or if residual uncertainty exists regarding potential impacts.

## 2.1 LEGISLATIVE CONTEXT

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, better known as the 'Habitats Directive', provides legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000 network.

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect European sites (Annex 1.1). Article 6(3) establishes the requirement for AA:

*'Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.'*

Article 6(4) states:

*'If, in spite of a negative assessment of the implications for the [Natura 2000] site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, Member States shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.'*

The provision for an AA is transposed into Irish law by Part XAB of the Planning and Development Act 2010 (as amended). Section 177U (4) of the said Acts provides for screening for Appropriate Assessment as follows:

*'The competent authority shall determine that an appropriate assessment of [...] a proposed development [...] is required if it cannot be excluded, on the basis of objective information, that the [...] proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site.'*

Section 177U (5) provides as follows:

*'The competent authority shall determine that an appropriate assessment of a [...] proposed development, [...], is not required if it can be excluded, on the basis of objective information, that the [...] proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site.'*

An AA should be based on best scientific knowledge and the competent authority should ensure that expertise such as ecological, geological, and hydrological are utilised, where relevant.

The Court of Justice of the European Union (CJEU) has made a number of rulings in relation to AA, regarding when it is required, its purpose, and the standards it should meet. Consideration has been given to the evolution in interpretation and application of directives and national legislation arising from jurisprudence of the European and Irish courts, in respect of Article 6 of the Habitats Directive.

## 2.2 STAGES INVOLVED IN THE APPROPRIATE ASSESSMENT PROCESS

There are potentially four stages in the AA process; derived from the *'Assessment of Plans and Projects Significantly affecting Natura 2000 sites: Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC'*. The result of each stage determines whether a further stage in the process is required. A summary of the four stages is provided hereunder.

### **Stage 1: Screening / Test of Significance**

This process identifies the likely significant effects upon a European site from a proposed project or plan. Its purpose is to determine, on the basis of a preliminary assessment and objective criteria, whether a plan or project which is not directly connected with or necessary to the management of the site as a European site, individually or in-combination with other plans or projects is likely to have a significant effect upon the European site, in view of its conservation objectives. A project may be "screened-in" if there is a possibility or uncertainty of possible effects upon the European site, requiring a Stage Two AA. If there is no evidence to suggest significant effects due to the proposed plan or development the project is "screened-out" from further assessment. It is this stage that is the focus of this report.

### **Stage 2: Appropriate Assessment**

In this stage, consideration is given to ascertain whether the plan or project would adversely affect the integrity of a European site(s), either alone or in-combination with other plans or projects, with respect to the European site's structure and function and its conservation objectives. This stage of the assessment is carried out by the consenting authority and is informed by a Natura Impact Statement (NIS). A NIS is required where there is uncertainty as to whether or not an adverse effect arises, uncertainty of the effect itself, or a potential effect has been defined which requires further procedures/mitigation to remove uncertainty of a defined impact (i.e., significant effects cannot be excluded). Where there are adverse effects, an assessment of the potential mitigation to ameliorate those effects is required. If the assessment results in a negative conclusion, i.e., adverse effects on the integrity of a site cannot be excluded (by design or mitigation) or there is uncertainty as to whether an adverse impact arises, then the process must consider alternatives (Stage 3) or proceed to Stage 4.

### **Stage 3: Assessment of Alternatives**

This stage of the potential process arises where adverse effects on the integrity of a European site cannot be excluded and examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the European site. However, in circumstances where there will not be any adverse effects on any European site, the developer places no reliance upon this third stage of the process in the context of this application for planning permission for the proposed development.

### **Stage 4: Assessment Where Adverse Effects Remain**

This is the derogation process of Article 6(4), which examines whether there are imperative reasons of overriding public interest [IROPI] for allowing a project to proceed where adverse effects on the integrity of a European site have been predicted. Compensatory measures must be proposed and assessed as part of this stage and the EU Commission must be informed of the compensatory measures. Again, the developer places no reliance upon this stage of the process in the context of the application for planning permission for the development.



## 2.3 LEGISLATION AND GUIDANCE

This report has been carried out using the following guidance:

- Communication from the Commission on the Precautionary Principle. Office for Official Publications of the European Communities, Luxembourg (European Commission [EC] 2000)<sup>1</sup>.
- Nature and Biodiversity Cases: Ruling of the European Court of Justice. Office for Official Publications of the European Communities, Luxembourg (EC, 2006)<sup>2</sup>.
- Managing Natura 2000 Sites – The provisions of Article 6 of the Habitats Directive 92/43/EEC. European Commission (EC, 2018)<sup>3</sup>.
- Interpretation Manual of European Union Habitats. Version EUR 28. European Commission (EC, 2013)<sup>4</sup>.
- Appropriate Assessment of Plans and Projects in Ireland, Guidance for Planning Authorities, Department of the Environment, Heritage and Local Government (DoEHLG, 2010)<sup>5</sup>.
- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission. Office for Official Publications of the European Communities, Luxembourg (EC, 2007)<sup>6</sup>.
- Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg (EC, 2001)<sup>7</sup>.
- Appropriate Assessment Screening for Development Management. Office of the Planning Regulator (OPR) Practice Note PN01 (OPR, 2021)<sup>8</sup>.

This report has similarly been prepared with regard to relevant rulings by the Court of Justice of the European Union (CJEU), the High Court, and the Supreme Court.

Definitions of conservation status, integrity and significance used in this assessment are defined in accordance with '*Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC*' (EC, 2018):

- Favourable conservation status (FCS) can only be defined and achieved at the level of the natural range of a species or a habitat type. A broad conservation objective aiming at achieving FCS can therefore only be considered at an appropriate level, such as for example the national, biogeographical or European level. The conservation measures have to correspond to the ecological requirements of the natural habitat types in Annex I and of the species in Annex II present on the site. The ecological requirements of those natural habitat

<sup>1</sup> Communication from the Commission on the Precautionary Principle: <https://op.europa.eu/en/publication-detail/-/publication/21676661-a79f-4153-b984-aeb28f07c80a/language-en>

<sup>2</sup> Nature and Biodiversity Cases: [https://friendsoftheireishenvironment.org/images/EULaw/ecj\\_rulings\\_en.pdf](https://friendsoftheireishenvironment.org/images/EULaw/ecj_rulings_en.pdf)

<sup>3</sup> European Commission (2018)

[https://ec.europa.eu/environment/nature/natura2000/management/docs/art6/Provisions\\_Art\\_6\\_nov\\_2018\\_en.pdf](https://ec.europa.eu/environment/nature/natura2000/management/docs/art6/Provisions_Art_6_nov_2018_en.pdf)

<sup>4</sup> Interpretation Manual:

[https://ec.europa.eu/environment/nature/legislation/habitatsdirective/docs/Int\\_Manual\\_EU28.pdf](https://ec.europa.eu/environment/nature/legislation/habitatsdirective/docs/Int_Manual_EU28.pdf)

<sup>5</sup> Appropriate Assessment of Plans and Projects:

[https://www.npws.ie/sites/default/files/publications/pdf/NPWS\\_2009\\_AA\\_Guidance.pdf](https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2009_AA_Guidance.pdf)

<sup>6</sup> Guidance Document on Article 6 (4):

[https://ec.europa.eu/environment/nature/natura2000/management/docs/art6/guidance\\_art6\\_4\\_en.pdf](https://ec.europa.eu/environment/nature/natura2000/management/docs/art6/guidance_art6_4_en.pdf)

<sup>7</sup> Assessment of plans and projects significantly affecting Natura 2000 sites:

[https://ec.europa.eu/environment/nature/natura2000/management/docs/art6/natura\\_2000\\_assess\\_en.pdf](https://ec.europa.eu/environment/nature/natura2000/management/docs/art6/natura_2000_assess_en.pdf)

<sup>8</sup> Appropriate Assessment Screening for Development Management: [9729-Office-of-the-Planning-Regulator-Appropriate-Assessment-Screening-booklet-15.pdf](https://www.opr.ie/9729-Office-of-the-Planning-Regulator-Appropriate-Assessment-Screening-booklet-15.pdf)

types and species involve all the ecological needs which are deemed necessary to ensure the conservation of the habitat types and species. They can only be defined on a case-by-case basis and using scientific knowledge.

- The integrity of a European site is defined as the coherent sum of the site's ecological structure, function, and ecological processes, across its whole area, which enables it to sustain the habitats, complex of habitats and/or populations of species for which the site is designated.
- Significant effect should be determined in relation to the specific features and environmental conditions of the protected site concerned by the plan or project, taking particular account of the site's conservation objectives and ecological characteristics.

## 2.4 DESKTOP STUDY AND INFORMATION SOURCES

A desktop study was undertaken to inform this screening assessment. The desktop study comprised a review of the following key datasets and information sources:

- Identification of European sites within the Zone of Influence (Zoi) of the development area through the identification of potential pathways/links from the development area and European sites and/or supporting habitats.
- Review of the National Parks and Wildlife Service (NPWS) site synopsis, Natura 2000 data forms and Conservation Objectives for European sites identified through potential pathways from the development (<https://www.npws.ie/protected-sites>).
- NPWS datasets on Annex I habitats and Annex II species.
- Review of available literature and web data. This included a detailed review of the NPWS and National Biodiversity Data Centre (NBDC) websites including mapping and available reports for relevant sites and in particular Qualifying Interests and Special Conservation Interests described and their Conservation Objectives.
- Review of Inland Fisheries Ireland (IFI) research data. This included reviewing research studies carried out for the Habitats Directive and Red Data Book Fish species within the receiving environment.
- Water Framework Directive (WFD) website: (<https://www.catchments.ie/guide-water-framework-directive/>).
- GIS Online mapping:  
(<http://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228>).
- Environmental Protection Agency (EPA) Mapping database:
- Review of previous ecological assessments undertaken within the area.

In addition, aerial photography (Google Maps, Bing Maps) and mapping (Ordnance Survey of Ireland, Geological Survey of Ireland) were used to identify non-designated habitats such as rivers, woodlands, and hedgerows of local ecological importance.

## 2.5 SCIENTIFIC AND TECHNICAL COMPETENCE RELIED UPON

The preparation of this NIS has involved collaboration from a range of experts across fields of ecology, hydrology and engineering. Many individuals have contributed to the preparation of this NIS which included collecting and assessing information from scientific literature and field surveys. This was coordinated and overseen by Ms. Laura Kennedy (TOBIN). Information on the background and experience of the principal contributors is set out below.

Brendan Rudden is a Chartered Engineer and has over 19 years' experience in Civil Engineering Projects. He is a specialist in project development and has worked on a large number of civil engineering and infrastructure projects including housing, quarries, sports facilities and waste management and recycling. He has worked on planning applications, fire safety certificates, waste permits, and civil engineering contract documents bringing projects from feasibility through to completion of construction. Project Engineer and EIS coordinator for the planning application lodged directly to An Bord Pleanala as a Strategic Infrastructure development including for the Oral Hearing process. TOBIN are lead consultants for the Galway Harbour Expansion (GHE) project and Brendan was the co-ordinator of the contributors for the EIS, planning application and for the Oral Hearing for this project. This involved consultations with the stakeholders and statutory bodies in the process. GHE is a Strategic Infrastructure Development (SID) project lodged directly to An Bord Pleanala and is likely to use the IROPI route under Article 6(4) of the European Habitats Directive. Brendan has presented and lectured in relation to this project.

Laura Kennedy is a Senior Ecologist and Project Manager with TOBIN Consulting Engineers and is a Project Ecologist for the Proposed Project. She holds an honors degree in Zoology from University College Cork and a Masters in Science in Environmental Science from Trinity College Dublin. She is a qualified and experienced environmental consultant with ten years' post-graduate experience in environmental sciences and environmental consultancy in Canada and Ireland. Laura has prepared and delivered Planning and Environmental Consideration reports, Technical Data reports, Environmental Assessments, Permit Applications, and Environmental Effects Monitoring reports for renewable energy projects, pipeline projects, and mining projects in Canada and Ireland.

Site surveys were undertaken by TOBIN (2014 to 2022) ecology staff including Kate Harrington and Jack Glennon. Kate has over 14 years' experience working as an ecologist in the research and consultancy sectors in Ireland and abroad. She has a B.A. Natural Sciences (Zoology), an M.Sc. (by research) in Zoology and a Graduate Diploma in Statistics. She has a broad skill-set including expertise in habitat survey, mammal survey, botanical survey (including moss and macrophytes) and aquatic surveys. She has significant experience in carrying out Ecological Impact Assessments (EclA) and Appropriate Assessment (AA) Screening and Stage 2 (NIS) for a wide range of developments including quarries, mining developments, C&D facilities and restoration projects (quarries and mines).

John Dillon is a Professional Geologist (P.Geo.) and chartered waste manager (MCIWM) in the Energy and Environment section of TOBIN. He holds a degree in Environmental Science from the National University of Ireland, Galway and a Masters in Science in Environmental Engineering from the Imperial College London. John provides project management, project co-ordination and specialist contribution to hydrogeology reports for Planning Applications, Environmental Impact Assessment Reports and waste licence applications. John has fifteen years' experience in the areas of environmental management and assessment with particular reference to the quarries, energy projects, hydrogeological projects and public consultation. John has been involved with the project management and co-ordination of Environmental Impact Assessment Reports, waste licence/permit applications, design and planning applications for retail/commercial developments, waste management facilities and quarries nationwide. John has contributed to Screening Reports and Natura Impact Statements for wastewater treatment plants, pipeline projects, solar farm and wind energy developments and has defended Appropriate Assessments at Oral Hearings for waste management facilities, quarry projects.

Figure 1: Regional Site Location Map

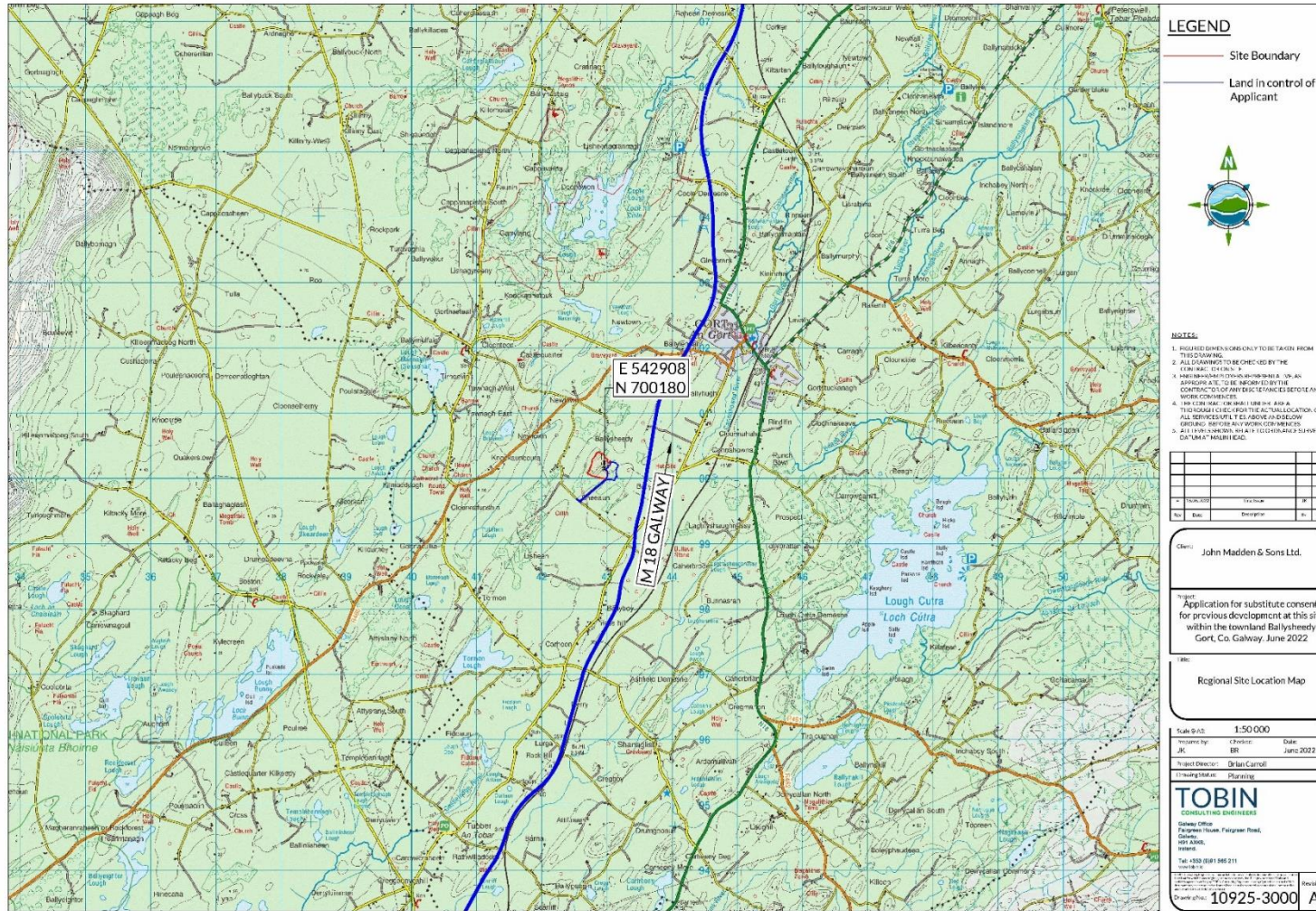
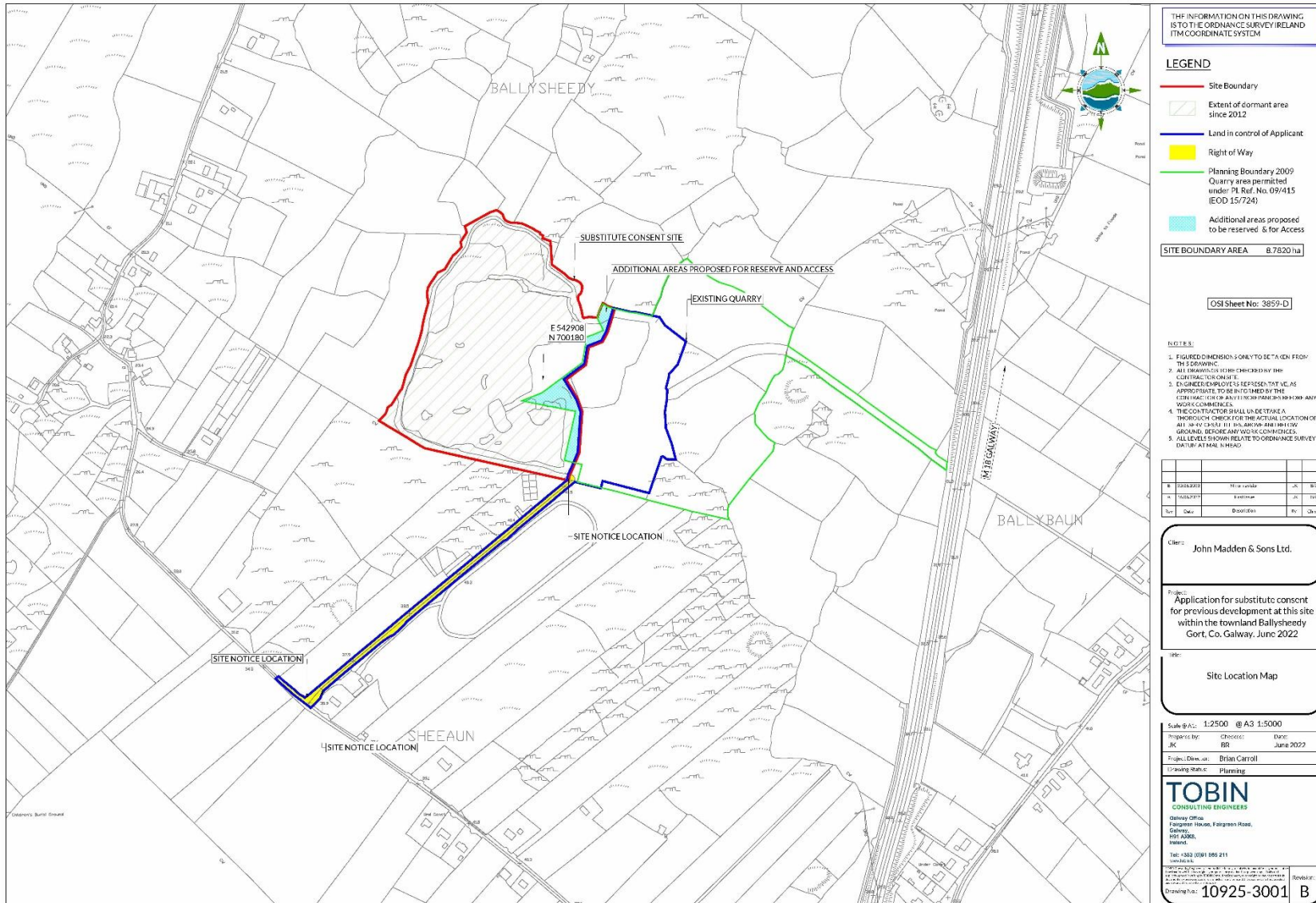


Figure 2 Proposed Site Layout



Ordnance Survey Ireland Licence number CYAL50233107. © Ordnance Survey Ireland Government of Ireland

## 3 DESCRIPTION OF THE DEVELOPMENT

### 3.1 RECEIVING ENVIRONMENT

Ballysheedy Quarry is set within a wider landscape dominated by improved agricultural grassland and hazel scrub. Landholdings immediately adjacent to the site are low-intensity agricultural grasslands and residential properties. The site is located within the Galway Bay South East Catchment.

The closest surface water features to the site include Newtown/Cooles Lough (4km N) and Drumminacloghaun Stream (1.5km W), to the Lough Termon (1.5km SE).

The quarry development entails a substitute consent for a dormant quarrying works within an overall landholding of approximately 12.9 ha. Part of the 8.78 hectare substitute consent area was extended beyond the boundary of the area permitted by the final Planning Permission of 09/415. This area is referred to as the “Substitute Consent” application area.

Ballysheedy Quarry is located just off the L8500 local road. This road travels from west to east and connects to the L4516 at the M18 flyover. The dormant quarry area is located to the north of this road. It consists of bare ground and is bordered to the south by an extensive area of scrub and agricultural grasslands.

The site has a history of planning consents for quarry related projects. In 1994 and 2009, planning permissions was granted for quarrying at the site. In addition, the surrounding lands are occupied by one additional industrial yard as a pipe storage yard and trunk workshop.

### 3.2 PROJECT OVERVIEW

The Planning Application is for Substitute Consent for quarry works on 8.78 hectares and includes areas previously granted under the 1994 and 2009 planning permissions.

The topography of the application area varies from approximately 26.0mOD at the lowest level of the quarry floor to approximately 43.0mOD at the highest point. The dormant quarry is located well above the regional water table, outside of the Substitute Consent area/Regeneration area. There is no proposal for any further excavation within the Substitute Consent area/Regeneration area.

### 3.3 DESCRIPTION OF PROJECT COMPONENTS

John Madden & Sons Ltd. propose to apply for a substitute consent (SC) for 8.78 hectares in relation to previous quarrying at Ballysheedy, Gort, Co. Galway. The dormant quarry (8.78 hectare SC area and quarry to the east of the SC area) was previously owned by Goode Concrete. The site had a number of previous permissions including permission 70238, Qy46 and a temporary phased lateral extension of extraction and temporary access road to the construction site of the proposed M18 Gort to Crusheen Motorway and associated processing plant and offices in the townlands of Ballysheedy, Gort, County Galway (09/415).

The overall substitute consent planning application which extended to 8.78Ha in the townland of Ballysheedy. The proposed M18 road scheme involved the construction of approximately 22 kilometres of dual carriageway, which bypassed the town of Gort and the village of Crusheen. The M17/M18 links Limerick and Galway and is now operational.

Quarrying operations included topsoil / overburden stripping at the western edge of the extension area. The topsoil / overburden was used for perimeter screening and stockpiled.

The former infrastructure including offices, weighbridge and wheelwash are located to the east of the substitute consent area. The limestone aggregate was extracted by drilling and blasting. Intensification occurred in 2009/2010 to supply the M18. Blasting occurred up to four times per month over the temporary period of the planning permission in order to supply the road building contract.

Extracted and processed aggregate was transported by means of an existing entrance granted in 1994 and via a temporary access/haul road direct from the quarry to the road construction site. This additional haul road in 2009 avoided additional haulage of aggregate via the public road network. The normal hours of operation of the quarry were 0700-1900 Monday to Friday and 0700-1300 on Saturday with no operations on Sundays.

#### *3.3.1 Sewerage and Waste Water Treatment*

A septic tank and percolation system was located to the east of the application area in PL09/415 were (as shown on Figure 2). The existing septic tank on the site is not currently in use as the existing remaining quarry site is presently dormant. The septic tank was in good condition in 2020.

#### *3.3.2 Surface Water/Stormwater*

With the exception of the flooded quarry pit in the Substitute Consent area/Regeneration area, there are no surface water features within the Ballysheedy Quarry site and there are no current or proposed surface water discharges from the site.

An important factor in relation to water was the control and management of rainwater falling within the Substitute Consent site.

Groundwater recharge to the underlying aquifers is diffuse (rainfall) directly into the aquifers where bedrock is present i.e., within the SC Quarry Site/Regeneration area.

### *3.3.3 Groundwater*

The floor water levels of the quarry pit (SC Quarry Site/Regeneration area) remain constant between the summer and winter months with little variation in levels. This water recharges to the underlying aquifer diffusely. The quarry floor does not dry out during the spring and summer period.

### *3.3.4 Vehicle Wheelwash Water*

The vehicle/wheelwash bay is located in the granted 09/415 area to the east of the substitute consent application area.

### *3.3.5 Drinking Water:*

Drinking water for the facility were imported water, located at a machine in the staff office/canteen.

### *3.3.6 Site Services*

Electricity, lighting and heating are provided via the electricity network to the site office and Quarry Extension area 09/415. A range of fire extinguishers (water, foam and CO<sub>2</sub>) were kept at the site office to deal with any potential localised small scale fires that might occur.

### *3.3.7 Solid Waste Management*

The operator as part of the company's existing operations, minimise production of waste and where appropriate consider its beneficial use, including recycling. Similarly, all waste at the Ballysheedy Quarry site were minimised and managed in accordance with the relevant legislation and other controls in place. Good practices were achieved when recycling used oils and greases, batteries, tyres, scrap metal and timber.

#### **3.3.7.1 Site Security**

Site security arrangements currently employed within the dormant Ballysheedy Quarry site were maintained and updated (where required) for the developments. The current security arrangements include fencing around the deep quarry extraction area of the site; a wall, a gate and hedgerow along the access road and stone walls and hedgerows around the site boundary.

The substitute consent area will only be accessed for maintenance purposes, along the retained maintenance access track, as shown on Figure 2.

Additional to the security measures employed, the natural setting of the site aids site security. The existing hedge line and hazel scrub along the southern and eastern and northern boundaries of the site naturally prohibits unauthorised entry. In addition, the site is set back from the M18, with no views of the site from this road.

The security measures employed will help to ensure that accidental entry to the site is prevented. Regular inspections of the site security arrangements are undertaken and repaired immediately if any damage is noted.

### *3.3.8 Working Hours*

The hours of operation at the Ballysheedy Quarry were 07:00 to 19:00 Monday to Friday and 07:00 to 14:00 on Saturdays.



### *3.3.9 Traffic Control*

The main extraction phase utilised a dedicated quarry access directly to the M18 construction site. A southern entrance is located to the south of the site.

### *3.3.10 Site Roads and Parking*

All trucks entering the site were confined within the site boundary through the internal road network and traffic management plan.

### *3.3.11 Site Management*

A competent management structure was in place on site at all times, under the direction and supervision of an experienced Manager.

Due to the liquidation of the previous operator of the quarry i.e., Goode Concrete Ltd, the Lands were purchased by current owner. Natural regeneration is taking place within the substitute consent area. Stockpiles of graded course crushed gravel are slow to recover due to the lack of rooting material on the stockpiles.

It is proposed to provide additional planting around the perimeter of the site and to secure and maintain the boundary walls and security fencing. Access is required around the perimeter fencing at the upper level of the quarry site, and thus the existing maintenance access track were maintained, as shown on Figure 2.

Site surveys have not identified significant quantities of waste within the Substitute Consent area. No works are required within the lower floor level of the quarry pit. In the intervening years since this site was operational, there has been a continuing trend of revegetation and recolonisation. It is proposed to avoid interference with this process.

The upper bench of the quarry, at original ground level, which was not quarried, has very considerably recolonised with grasses and scrub and brambles. Only minimal measures such as encouraging native species i.e., hazel regeneration is proposed here, to increase screening and inhibit competition by non-native species (sycamore).

## 4 STAGE 1 SCREENING FOR APPROPRIATE ASSESSMENT

### 4.1 INTRODUCTION

The Screening Stage of the AA process identifies any likely significant effects upon European Sites from the project alone or in-combination with other projects or plans. A series of questions are asked during the Screening Stage of the AA process in order to determine:

- whether a plan or project can be excluded from AA requirements because it is directly connected with or necessary to the management of a European Site; and
- whether the project or plan will have a potentially significant effect on a European Site, either alone or in combination with other projects or plans, in view of the site's Conservation Objectives or if residual uncertainty exists regarding potential impacts.

Screening for Appropriate Assessment (AA) was undertaken for this project based on the following:

1. Description of the development;
2. Identification of relevant European Sites, and compilation of information on their qualifying interests and conservation objectives;
3. Assessment of likely significant effects – direct, indirect and cumulative – undertaken based on available information; and
4. Screening conclusions.

See Appendix A for the proposed site layout plans.

### 4.2 DESKTOP STUDY

An ecological desktop study was completed comprising the following elements:

- Identification of European Sites within the Zone of Influence (Zoi) of the development area through the identification of potential pathway links for specific sites. This study zone should account for any European Sites connected to the site by watercourses.
- Review of the National Parks and Wildlife Service (NPWS) site synopsis and conservation objectives for European Sites<sup>9</sup> with identification of potential pathways from the site.
- Review of available literature and web data. This included a detailed review of the NPWS website including mapping and available reports<sup>10</sup> for relevant sites and sensitive qualifying interests described and their conservation objectives.
- Review of watercourses in the area and the direction of flow<sup>11</sup>.

An outline of the key datasets and information sources reviewed is provided below:

- NPWS database of areas designated (and proposed) for nature conservation<sup>12</sup>;
- National Biodiversity Data Centre database<sup>13</sup>;

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<sup>9</sup> <http://www.npws.ie/protectedsites/>

<sup>10</sup> <http://www.npws.ie/mapsanddata/>

<sup>11</sup> EPA AA Mapping Website: <http://www.epa.ie/terminalfour/AppropAssess/index.jsp>

<sup>12</sup> National Parks and Wildlife Service: <http://www.npws.ie/maps-and-data/>;

<sup>13</sup> National Biodiversity Data Centre: <http://maps.biodiversityireland.ie/#/Map>

- EPA Envision database<sup>14</sup>; and
- GSI database<sup>15</sup>.

### 4.3 FIELD SURVEY

A series of Ecological Field Surveys have been conducted for the previous and current planning application for the Ballysheedy Quarry site. Site surveys were carried out between June 2014 and July 2020 and June 2022; with additional survey work completed for monitoring of water levels. During the surveys, particular attention was given to the possible presence of habitats and/or species which are legally protected in Ireland under European or Irish legislation. Hardcopy field maps showing aerial photography overlaid with GIS layers (landholdings and designated sites) were used during field survey. Photographs from the site visits are included in Appendix B. The site visit confirmed that the site is predominantly bare ground with a flood area to the west of the application area. No protected flora was recorded during the site visit.

#### 4.3.1 Terrestrial Habitats and Flora

A 'Habitat Survey' was conducted within the Ballysheedy Quarry site/application area (hereafter referred to as 'Study Area') and took in adjacent land, in accordance with The Heritage Council's methodology - *Best Practice Guidance for Habitat Survey and Mapping* (Smith *et al.*, 2011). Habitats were classified according to The Heritage Council's - *A Guide to Habitats in Ireland* (Fossitt, 2000) and following the EU - *Habitats Interpretation Manual for Annex 1 Habitats*. The data was recorded, and the habitats encountered during the site visit were classified in accordance with Fossitt (2000) with reference made to the '*Interpretation Manual of EU Habitats*' (EC, 2013) as appropriate. Plant identification and nomenclature principally follows Webb *et al.* (1996)<sup>16</sup>. Grass and fern identification and nomenclature was further assisted by Rose (1989)<sup>17</sup>. The predominant plant species for each habitat type were recorded in order to accurately determine habitats present on the site. Mosses and liverworts were identified using Atherton *et al.* (2010)<sup>18</sup>.

#### 4.3.2 Terrestrial Fauna

Mammal Surveys involved recording sightings, tracks and signs (droppings, resting places, burrows/setts/dens) of mammal species during the site walkover surveys. The Substitute Consent site was surveyed for protected flora and fauna and any evidence of Annex I habitats or Annex II species listed on the EU Habitats Directive (92/43/EEC) and Annex I bird species listed on the EU Birds Directive (2009/147/EC). The substitute consent site was also searched for evidence of invasive plant species listed in Part 1 of the Third Schedule of S.I No. 477 of 2011, European Communities (Birds and Natural Habitats) Regulations (2011). The findings of the surveys were used to inform this assessment.

Sightings of invertebrates, reptiles and amphibians were also recorded. Devil's-bit scabious *Succisa pratensis* was not detected on the site.

The surveys in May/June 2020 were carried out within the bird breeding season. The presence of bird species was determined through direct sightings or audible calls. While all birds were recorded,

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<sup>14</sup> Environmental Protection Agency; <http://gis.epa.ie/Envision>

<sup>15</sup> Geological Survey Ireland; <http://spatial.dcenr.gov.ie/GeologicalSurvey/Groundwater/index.html>

<sup>16</sup> Webb, Parnell & Doogue (1996). *An Irish Flora*.

<sup>17</sup> Rose (1989) *Colour Identification Guide to the Grasses, Sedges, Rushes and Ferns of the British Isles and north-western Europe*.

<sup>18</sup> Atherton, Bosanquet & Lawley (2010) *Mosses and Liverworts of Britain and Ireland a field guide*. British Bryological Society

the focus was to determine species of conservation concern including species listed on Annex 1 of the EU Birds Directive, and Red and Amber listed species of High and Moderate conservation concern respectively<sup>19</sup>. Peregrine falcon was noted to the west of the development.

#### 4.3.3 Bat Methodology

Daytime bat potential surveys included an assessment of suitable bat roost sites/habitats within the Study Area and adjacent habitats. A nocturnal bat activity survey was conducted on 18<sup>th</sup> June 2020 by an experienced bat surveyor, familiar with vocal and visual (dusk) signs of bat activity and species identification, including Lesser horseshoe bat (*Rhinolophus hipposideros*). Conditions were suitable for survey (calm, mild and at time of year when bat activity would be detectable). Bats were identified by their ultrasonic calls using a 'Echometer EM3+' ultrasonic recorder coupled with behavioural and flight observations. This recorder allows review of spectrograms in real time and recording of bat ultrasounds for more detailed analysis. The EM3+ allows a user selectable sample rate of 384kHz, the recommended option in areas where Lesser horseshoe bats may be present. The focus of the survey was to detect presence of all bat species, in particular Lesser horseshoe bat (*Rhinolophus hipposideros*), as this species is protected under Annex II and Annex IV of the Habitats Directive and is a qualifying interest of designated conservation sites within the wider study area. Bat activity surveys were conducted as follows:

- The Study Area was surveyed by foot with a heterodyne bat detector (Batbox), where access allowed;
- A 15 minute static activity survey was carried out at each of 3 No. locations within the Ballysheedy Quarry site;
- Fringing Hazel scrub and remnants within the Study Area were surveyed;
- The roadways to the south of the Ballysheedy Quarry site were driven with the bat detector so as to record any signs of bat activity<sup>20</sup>.

The presence of lesser horseshoe bat within and surrounding the development may result in the impact of the populations of this species in East Burren Complex SAC, where the lesser horseshoe bat is a Qualifying Interest species. However, the development is not expected to impact on the populations and roosts for which the SACs are designated. East Burren Complex SAC has been selected for lesser horseshoe bats because of the presence of two known nursery roosts, a transition roost and four known winter sites, the latter all in natural limestone caves. There are no known roosts on the site. Lesser horseshoe bats core foraging range is 2.5km from their roosts. The development is located approximately 2km from roosts outside the East Burren SAC

Other roosts for the lesser horseshoe bat (an Annex II and Annex IV species), did occur within 2.5km of the development. Impacts on these roosts could not be ruled out, due to the loss of foraging habitat and possible disturbance from light. However, as these roosts were not located within any European sites, mitigation measures do not need to be dealt with by the Appropriate Assessment process. Instead, mitigations for lesser horseshoe bats and other bat species located within the boundary of the Substitute Consent site, were examined in the Ecological Report for the development<sup>21</sup>.

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<sup>19</sup> Colhoun K. & Cummins S. (2013). *Birds of Conservation Concern in Ireland 2014-2019*. Irish Birds 9:523-544 (2013)

<sup>20</sup> Roche, N., Langton, S. and Aughney T. (2012) Car-based bat monitoring in Ireland 2003-2011. Irish Wildlife Manuals, No. 60. National Parks and Wildlife Service, Department of the Arts, Heritage and the Gaeltacht, Ireland.

Other sites reviewed for potential links to the development, but not considered to be within the Zol of the development due to a lack of pathways include Galway Bay Complex SAC and Galway Bay SPA. A review of these European sites noted they are located in separate sub-catchments to the development, are considered beyond the normal core foraging/commuting range of Qualifying Interest species. It is therefore considered unlikely that any significant impacts may occur to these designated sites and their Qualifying Interests as a result of the development.

#### 4.4 DETERMINING THE LIKELY ZONE OF INFLUENCE

Guidance on AA of Plans and Projects in Ireland notes that a distance of 15km is recommended in the case of plans, derived from UK guidance. In some cases, the distance could be much less or much more than 15km, but this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors and for the in-combination effects.

Using the source-pathway-receptor model<sup>22,23</sup> an examination of the potential effects of the development was undertaken (alone and / or in-combination) to identify what European sites, and which of their qualifying interests or special conservation interest species were potentially at risk. This was required to determine the Zol for the development. This conceptual model is a standard tool in environmental assessment. In order for an effect to occur, all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism means there is no likelihood for the effect to occur. In the context of the development, the model comprises:

- Source (s) – potential impacts from the Substitute Consent site, e.g., the runoff of sediment/construction pollution;
- Pathway (s) – hydrological, physical or ecological connectivity between the Substitute Consent and the European site; and
- Receptor (s) – qualifying interests and/or special conservation interests of the European sites.

The Chartered Institute of Ecology and Environmental Management (CIEEM) defines the Zol of a project as the area(s) over which ecological features may be affected by the biophysical changes caused by the proposed project and associated activities. In order to establish the Zol of the proposed development works, the likely key biophysical changes associated with the works were determined having regard to the project characteristics set out in Section 3.1 of this report. The Zol of the proposed development is described hereunder.

Impacts associated with the loss of habitats will be confined to within the substitute consent site boundary. The Zol was therefore defined as all lands within the proposed development site boundary.

With regards potential habitat degradation effects associated with the release of pollutants to surface water, the Zol of the proposed development is considered to include receiving waterbodies adjacent to or downstream of the substitute consent site during the construction phase. The distance downstream is associated with the current biological condition of the accepting waterbody and its capacity to accept and assimilate sediment and other pollutants.

The development occurs on the groundwater waterbodies (GWB), GWDTE-Caherglassaun Turlough (SAC000238)). The Water Framework Directive ([www.wfdireland.ie](http://www.wfdireland.ie)) for the period 2013-2018 describes the groundwater quality status as 'Poor'. These classifications are based on an

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<sup>22</sup> Cooper, L. M. (2004). Guidelines for Cumulative Effects Assessment in SEA of plans. EPMG Occasional Paper 04/LMC/CEA, Imperial College London.

<sup>23</sup> OPW (2012), Arterial Drainage Maintenance categories, Source » Pathway » Receptor Chains for Appropriate Assessment. OPW, Galway

assessment of the point and diffuse sources in the area that may affect the groundwater quality. Phosphate (MRP) from agriculture and forest are the main PO<sub>4</sub> in groundwater the main cause for poor status. There is no phosphate generated during quarrying activities. No phosphate has been applied to landholding during the quarrying operations. Due to the limited groundwater connectivity at the site and lack of connection to the large conduits in the GWB, there is no significant impact from the development site. Water quality at the site is good. The spatial limit of dust impacts was established as 100m from the main development site and 50m from the access road works.

Noise from the construction activity had the potential to cause disturbance to resting, foraging and commuting qualifying and special conservation interest species. Individual species will elicit differing behavioural responses to disturbance at different distances from the source of disturbance. Below is a summary of the documented zones of influence for varying species.

- Transport Infrastructure Ireland (formally the National Roads Authority) has produced a series of planning and construction guidelines<sup>24</sup> for the treatment of certain protected mammal species (i.e., otter), which indicate that disturbance to terrestrial mammals would not extend beyond 150m for the type of works proposed.
- Cutts *et al.* (2013)<sup>25</sup> notes that different types of disturbance stimuli are characterised by different avifaunal reactions, however as a general rule of thumb, a distance of 300m can be used to represent the maximum likely disturbance distance for waterfowl.

The Zol for noise/disturbance was therefore established as the substitute consent site plus a 300m buffer.

#### 4.5 IDENTIFICATION OF RELEVANT EUROPEAN SITES AND COMPILATION OF INFORMATION ON THEIR QUALIFYING INTERESTS AND CONSERVATION OBJECTIVES

Guidance on Appropriate Assessment of Plans and Projects in Ireland notes that a distance of 15 km is recommended in the case of plans, derived from UK guidance<sup>26</sup>. For projects, the distance could be much less than 15 km, and in some cases less than 100 m, but this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in combination effects.

Using the source-pathway-receptor model an examination of the potential effects of the project was undertaken (alone and in-combination) to identify what European sites, and which of their qualifying interests; special conservation interests or conservation objectives, were potentially at risk. This determined the zone of influence (Zol) of the project. This conceptual model is a standard tool in environmental assessment. For an effect to occur, all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism means there is no likelihood for the effect to occur. In the context of the Substitute Consent site, the model comprises:

- Source (s) – e.g., sediment run-off from Substitute Consent site
- Pathway (s) – e.g., water flow connecting to a European site
- Receptor (s) – Qualifying habitats and species of European sites

<sup>24</sup> Ref: <http://www.tii.ie/technical-services/environment/>

<sup>25</sup> Cutts, N., Hemingway, K., Spencer, J., (2013). Waterbird Disturbance Mitigation Toolkit Informing Estuarine Planning and Construction Projects.

<sup>26</sup> Department of the Environment, Heritage and Local Government DEHLG (2010). *Appropriate Assessment of Plans and Projects in Ireland, Guidance for Planning Authorities.*

Those considered relevant to the development are listed in Table 4-1. The other European Sites detailed on Figure 1-1 have no pathway connecting to the Substitute Consent site and can therefore be screened out for potential impacts.

It is vital that an assessment of potential source-pathway-receptor links is undertaken to assess potential impact links between the receptor (European Sites) and source (Substitute Consent site) to establish the risk of any likely significant effects. Additional designated sites including proposed Natural heritage Areas (pNHA's), Natural Heritage Areas and RAMSAR sites were also reviewed, as although they do not form part of the Appropriate Assessment, they often provide important supporting functions to European Sites.

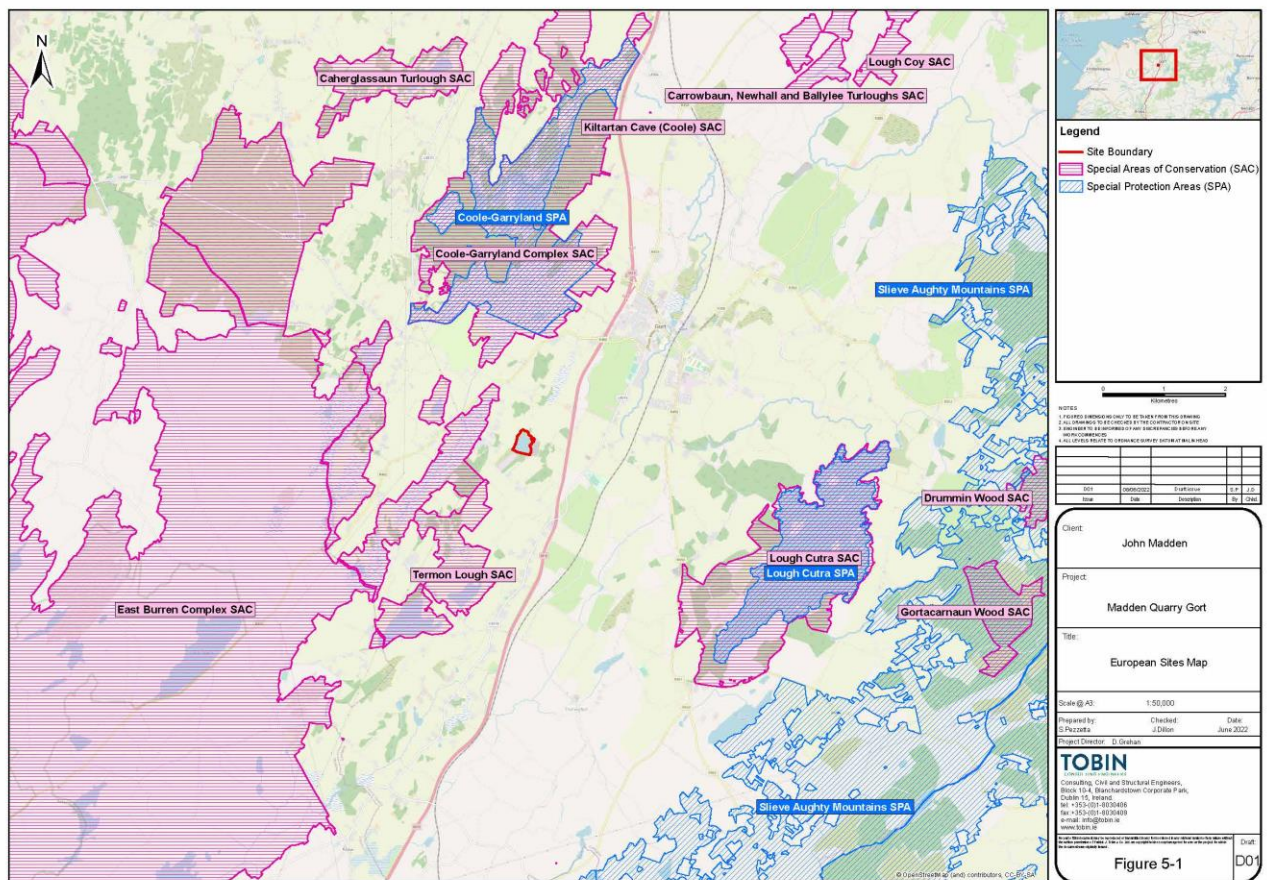


Figure 3: Designated Conservation Areas

**Table 4-1: Special Areas of Conservation (SACs), Special Protection Areas (SPAs), within Zone of Influence of the Substitute Consent site.**

European Site	Qualifying Interests
<p>East Burren Complex SAC This large site incorporates all of the high ground in the east Burren in Counties Clare and Galway and extends south-eastwards to include a complex of calcareous wetlands. . The site exhibits some of the best and most extensive areas of oligotrophic limestone wetlands to be found in the Burren and in Europe. Distance: 0.65 km southwest</p>	<p>Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140] Turloughs [3180] Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation [3260] Alpine and Boreal heaths [4060] Juniperus communis formations on heaths or calcareous grasslands [5130] Calaminarian grasslands of the Violetalia calaminariae [6130] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510] Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7210] Petrifying springs with tufa formation (Cratoneurion) [7220] Alkaline fens [7230] Limestone pavements [8240] Caves not open to the public [8310] Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] Euphydrias aurinia (Marsh Fritillary) [1065] Rhinolophus hipposideros (Lesser Horseshoe Bat) [1303] Lutra lutra (Otter) [1355]</p>
<p>Termon Lough SAC It consists of a series of three turloughs, with low, drift-covered slopes on all sides except in the north-east, where a small area of limestone pavement is found. The turloughs are hydrologically linked at times of high water. Distance: 0.9 km south</p>	<p>Turloughs [3180]</p>
<p>Caherglassaun Turlough SAC This site is notable for its pronounced 'tidal' fluctuation and its complement of rare plants and animals. There is also a roost for Lesser horseshoe bat. Distance: 5.6 km northwest</p>	<p>Lesser horseshoe bat (<i>Rhinolophus hipposideros</i>) [1303] Turloughs [3180]</p>



European Site	Qualifying Interests
<p>Coole-Garryard Complex SAC</p> <p>The turlough system at this site is considered to be the most diverse in the county and the association with woodland is of note. The turloughs are surrounded by woodland, pasture and limestone heath. The nationally rare Mudwort <i>Limosella aquatic</i> and Dropwort <i>Filipendula vulgaris</i> also occur at the site. These two plant species are listed in the Irish Red Data Book, and Mudwort is included in the Flora (Protection) Order, 1999.</p> <p>Distance: 1.4 km north</p>	<p>Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation [3150]</p> <p>Turloughs [3180]</p> <p>Rivers with muddy banks with <i>Chenopodium rubri</i> p.p. and <i>Bidention</i> p.p. vegetation [3270]</p> <p><i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130]</p> <p>Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>)(*important orchid sites) [6210]</p> <p>Limestone pavements [8240]</p>
<p>Castletaylor Complex SAC</p> <p>12km N</p>	<p>Turloughs [3180]</p> <p>Alpine and Boreal heaths [4060]</p> <p><i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130]</p> <p>Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) [6210]</p> <p>Limestone pavements [8240]</p>
<p>Ardrahan Grassland SAC</p> <p>Site dominated by a large flat limestone area with a mosaic of calcareous habitats include limestone pavement, alpine heath, Juniper scrub and species rich dry grasslands.</p> <p>Distance:11km to north</p>	<p>Alpine and Boreal heaths [4060]</p> <p><i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130]</p> <p>Limestone pavements [8240]</p>
<p>Kiltiernan Turlough SAC</p> <p>This site comprises a flattish basin which lies approximately 2m below road level and include about eight further depressions which are joined in times of high water. The red data book species fen violet <i>Viola persicifolia</i> is known from the site.</p> <p>Distance: 13 km north</p>	<p>Turloughs [3180]</p>
<p>Lough Fingall Complex SAC</p> <p>The site comprises a mix of habitats, dominated by turloughs and limestone pavement. The red data book species Alder Buckthorn is known from the site. Cloghballymore House provides a summer breeding site for Lesser horseshoe bat.</p> <p>Distance: 13 km to northwest</p>	<p>Lesser horseshoe bat (<i>Rhinolophus hipposideros</i>) [1303]</p> <p>Turloughs [3180]</p> <p>Alpine and Boreal heaths [4060]</p> <p><i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130]</p> <p>Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>)(*important orchid sites) [6210]</p> <p>Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> [7210]</p> <p>Limestone pavements [8240]</p>
<p>Rahasane Turlough SAC</p>	<p>Turloughs [3180]</p>

European Site	Qualifying Interests
<p>This site consists of two basins which are connected at times of flood. The turlough is naturally eutrophic due to its large catchment. The red data book species fen violet <i>Viola persicifolia</i> is known from the site.</p> <p>Distance: 16 km north</p>	
<p>Rahasane Turlough SPA</p> <p>The site is known for its wintering wildfowl populations with internationally important numbers of Whooper Swan, Golden Plover, Wigeon and Shoveler; and for supporting nesting waders in summer including Lapwing, Redshank, Snipe and Dunlin.</p> <p>Distance: 16 km north</p>	<p>Whooper Swan (<i>Cygnus cygnus</i>) [A038]          Wigeon (<i>Anas penelope</i>) [A050]          Golden Plover (<i>Pluvialis apricaria</i>) [A140]          Black-tailed Godwit (<i>Limosa limosa</i>) [A156]          Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395]          Wetlands &amp; Waterbirds [A999]</p>
<p>Inner Galway Bay SPA</p> <p>A large marine dominated site supports an excellent diversity of wintering wetland birds. There are internationally important populations of Great Northern Diver and Brent Goose, with nationally important populations of 16 other species.</p> <p>Distance: 11.2 km northwest</p>	<p>Great Northern Diver (<i>Gavia immer</i>) [A003]          Cormorant (<i>Phalacrocorax carbo</i>) [A017]          Grey Heron (<i>Ardea cinerea</i>) [A028]          Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046]          Wigeon (<i>Anas penelope</i>) [A050]          Teal (<i>Anas crecca</i>) [A052]          Shoveler (<i>Anas clypeata</i>) [A056]          Red-breasted Merganser (<i>Mergus serrator</i>) [A069]          Ringed Plover (<i>Charadrius hiaticula</i>) [A137]          Golden Plover (<i>Pluvialis apricaria</i>) [A140]          Lapwing (<i>Vanellus vanellus</i>) [A142]          Dunlin (<i>Calidris alpina</i>) [A149]          Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157]          Curlew (<i>Numenius arquata</i>) [A160]          Redshank (<i>Tringa totanus</i>) [A162]          Turnstone (<i>Arenaria interpres</i>) [A169]          Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]          Common Gull (<i>Larus canus</i>) [A182]          Sandwich Tern (<i>Sterna sandvicensis</i>) [A191]          Common Tern (<i>Sterna hirundo</i>) [A193]          Wetlands &amp; Waterbirds [A999]</p>
<p>Galway Bay Complex SAC</p> <p>This large site includes a diverse range of marine, coastal and terrestrial habitats including saltmarsh, coastal lagoons, turloughs, fens and grasslands. It also supports a common seal colony, a breeding otter population and four red data book plant species.</p> <p>Distance: 11.2 km northwest</p>	<p>Mudflats and sandflats not covered by seawater at low tide [1140]          Coastal lagoons* [1150]          Large shallow inlets and bays [1160]          Reefs [1170]          Perennial vegetation of stony banks [1220] (Salicornia) and other annuals colonizing mud and sand [1310]</p>

European Site	Qualifying Interests
	Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritima</i> ) [1330] Otter ( <i>Lutra lutra</i> ) [1355] Common seal ( <i>Phoca vitulina</i> ) [1365] Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) [1410] Turloughs* [3180] ( <i>Juniperus communis</i> ) formations on heaths or calcareous grasslands [5130] Semi-natural dry grasslands and scrubland facies on calcareous substrates ( <i>Festuco Brometalia</i> )(*important orchid sites) [6210] Calcareous fens with ( <i>Cladium mariscus</i> ) and species of the Caricion <i>davallianae</i> * [7210] Alkaline fens [7230]
Ballinduff Turlough SAC Site supports a wide range of turlough habitats. The presence of the shoreweed <i>Littorella uniflora</i> is notable. Distance: 7.4 km north	Turloughs [3180]
Cahermore Turlough SAC This site supports a wide range of turlough habitats with well-developed plant communities. The amount and quality of the developing woodland is a special feature of this turlough. Distance: 7km north	Turloughs [3180]
Peterswell Turlough SAC This is a large and important site which shows an excellent range of vegetation along the turlough-callow gradient and includes a summer-dry turlough filled by a river. Distance 8 km north west	Turloughs [3180]
Carrowbaun, Newhall & Ballylee Turloughs SAC The vegetation of Carrowbaun, Newhall and Ballylee has been largely modified by drainage works, fertilization and over-grazing, which reduce their botanical value. However, the wet plant communities in north Carrowbaun and the turlough scrub are important botanically. The presence of a high diversity of waterbirds and the roost of Lesser horseshoe bats adds to the ecological interest of the site. Distance: 7.1 km south	Turloughs [3180]
Lough Coy SAC Lough Coy is an excellent example of a eutrophic (nutrient-rich) turlough. The extreme water fluctuation supports a distinctive zonation of	Turloughs [3180]

European Site	Qualifying Interests
<p>vegetation and provides many niches for specialist plants. It is an important site for wintering waterfowl. Distance: 7.8 km north west</p>	
<p>Slieve Aughty Mountains SPA This large site comprises a range of upland habitats. It is a stronghold for hen harrier and supports the second largest concentration in the country. It also supports a breeding population of Merlin. Distance: 6 km east</p>	<p>Hen Harrier (<i>Circus cyaneus</i>) [A082] Merlin (<i>Falco columbarius</i>) [A098]</p>
<p>Cregganna Marsh SPA This site, comprising wet and improved grasslands, is of importance as a feeding site for a nationally important flock of Greenland white-fronted geese. Distance: 9.8 km southwest</p>	<p>Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395]</p>
<p>Sonnagh Bog SAC Sonnagh Bog is important as a good example of an intact, lightly grazed, highland blanket bog. Distance: 14.5 km east</p>	<p>Blanket bog (*active only) [7130]</p>
<p>Lough Cutra SAC Lough Cutra is a large oligo/mesotrophic freshwater lake lying on limestone, but with much sediment washed down from the sandstone hills above. This lake is situated about 4 km south-east of Gort, Co. Galway. A series of connected woodlands on the western side of the lake has been included as foraging habitat for the Lesser horseshoe bats which roost at the site. Distance: 4.1 km east</p>	<p>Lesser horseshoe bat (<i>Rhinolophus hipposideros</i>) [1303]</p>
<p>Lough Cutra SPA This site is of particular importance for its long-established breeding colony of Cormorant. It is of regional importance for wintering waterfowl. The regular occurrence of Whooper Swan, albeit in low numbers, is of note. Distance: 4.1 km east</p>	<p>Cormorant (<i>Phalacrocorax carbo</i>) [A017]</p>

#### 4.6 IDENTIFICATION OF LIKELY SIGNIFICANT EFFECTS

Potential impacts and their significance, if any, from development in this area on the European sites listed above are considered in Table 3-2 where a source-receptor-pathway relationship has been identified. Impacts are considered in light of the conservation objectives of the qualifying features for which the site is designated.

Direct impacts did not occur to any Natura 2000 site as the Substitute Consent site is not located within any European site designation.

The key issue being considered is the likelihood of indirect effects which could potentially interfere with the relationships that sustain qualifying interests associated with the Natura 2000 sites. The potential indirect effects are mainly associated with the construction and operation phase. The potential impacts arise pre mitigation without the use of standard design and good practice measures to reduce impacts.

Potential exists for a reduction in water quality within the Coole Garryland SAC due to the potential release of pollutants, mainly sediment from construction activities associated with the development site where surface water run-off may enter groundwater that are likely to discharge into Coole Garryland which is linked to Caherglassaun GWDTE i.e., Caherglassaun SAC.

Additionally, petroleum hydrocarbon compounds have potential to enter ground or surface water owing to spills or leaks associated with construction and operation phase activities associated with the Substitute Consent site. These releases may result in contaminated sites that pose a risk to ecology and/or water resources.

Using the pre-cautionary principle and a lack of consideration for protective mitigation measures, including standard good practice, design and operating procedures, the construction and operation phases of the Substitute Consent site are considered to have potential to result in significant effect on Coole Garryland SAC, Caherglassaun SAC and East Burren SAC located downstream and upstream of the Substitute Consent site and therefore, cannot be ruled out at this stage.

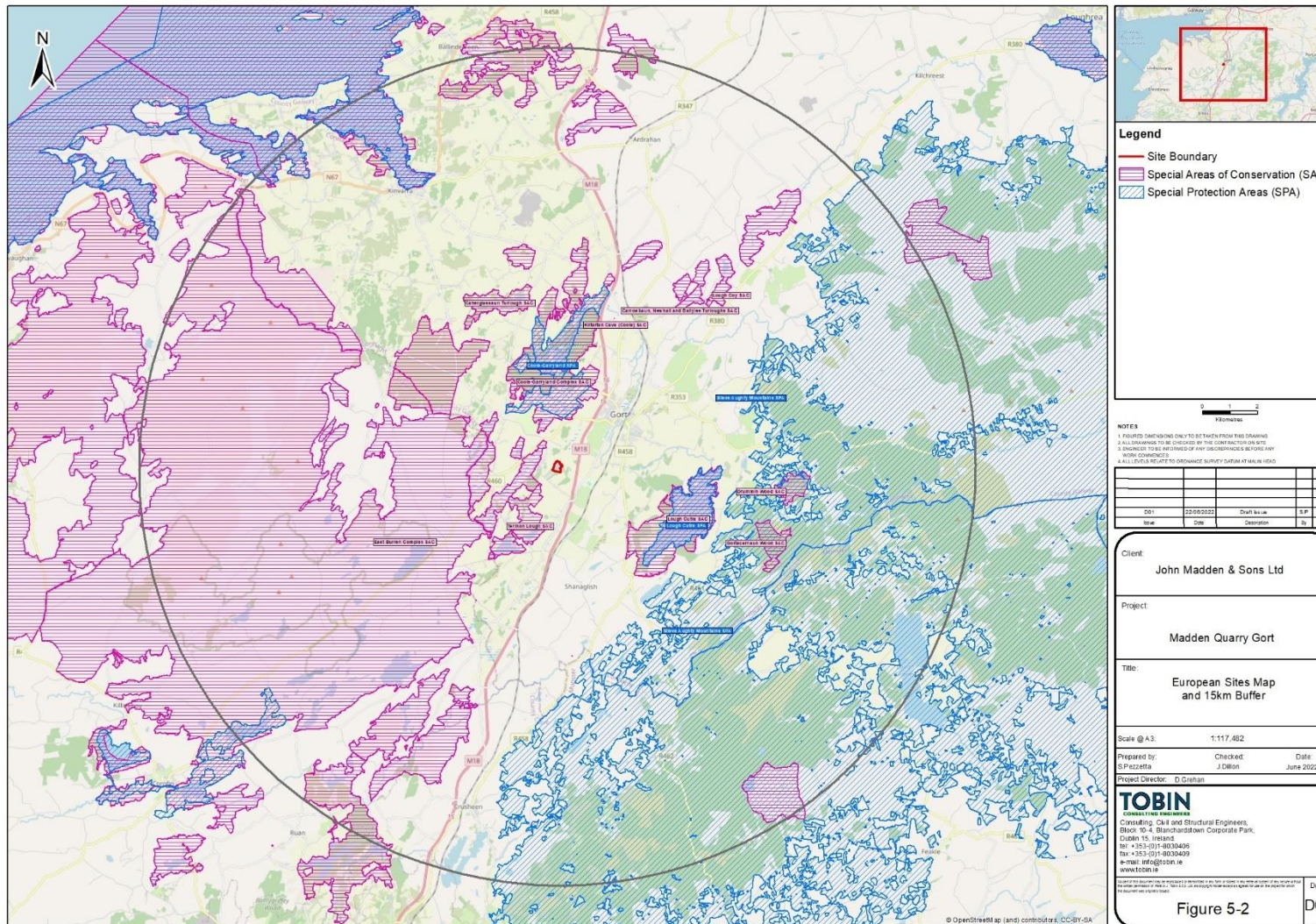


Figure 4: Designated Conservation Areas within 15 km Buffer

**Table 2: European Sites and their Qualifying Interests, Conservation Objectives and Threats and Pressures**

European Site	Qualifying Interests
<p>East Burren Complex SAC            Site includes Caranavoodaun turlough, woodland and mosaics of limestone pavement, grassland and heath.            Distance: 550m west</p>	<p>Turloughs [3180]            Alpine and Boreal heaths [4060]  <i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130]            Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia)(*important orchid sites) [6210]            Limestone pavements [8240]</p>
<p>Coole-Garryard Complex SAC            The turlough system at this site is considered to be the most diverse in the county and the association with woodland is of note. The turloughs are surrounded by woodland, pasture and limestone heath. The nationally rare Mudwort <i>Limosella aquatic</i> and Dropwort <i>Filipendula vulgaris</i> also occur at the site. These two plant species are listed in the Irish Red Data Book, and Mudwort is included in the Flora (Protection) Order, 1999.            Distance: 1.2km NW</p>	<p>Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation [3150]            Turloughs [3180]            Rivers with muddy banks with <i>Chenopodium rubri</i> p.p. and <i>Bidention</i> p.p. vegetation [3270]  <i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130]            Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia)(*important orchid sites) [6210]            Limestone pavements [8240]</p>
<p>Kiltiernan Turlough SAC            This site comprises a flattish basin which lies approximately 2m below road level and include about eight further depressions which are joined in times of high water. The red data book species fen violet <i>Viola persicifolia</i> is known from the site.            Distance: 13 km north</p>	<p>Turloughs [3180]</p>
<p>Lough Fingall Complex SAC            The site comprises a mix of habitats, dominated by turloughs and limestone pavement. The red data book species Alder Buckthorn is known from the site. Cloghballymore House provides a summer breeding site for Lesser horseshoe bat.            Distance: 13 km to north</p>	<p>Lesser horseshoe bat (<i>Rhinolophus hipposideros</i>) [1303]            Turloughs [3180]            Alpine and Boreal heaths [4060]  <i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130]            Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia)(*important orchid sites) [6210]            Calcareous fens with <i>Cladium mariscus</i> and species of the Caricion davallianae [7210]            Limestone pavements [8240]</p>
<p>Inner Galway Bay SPA            A large marine dominated site supports an excellent diversity of wintering wetland birds. There are internationally important populations of Great Northern Diver and Brent Goose, with nationally important populations of 16 other species.            Distance: 10.2 km northwest</p>	<p>Great Northern Diver (<i>Gavia immer</i>) [A003]            Cormorant (<i>Phalacrocorax carbo</i>) [A017]            Grey Heron (<i>Ardea cinerea</i>) [A028]            Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046]            Wigeon (<i>Anas penelope</i>) [A050]            Teal (<i>Anas crecca</i>) [A052]            Shoveler (<i>Anas clypeata</i>) [A056]            Red-breasted Merganser (<i>Mergus serrator</i>) [A069]            Ringed Plover (<i>Charadrius hiaticula</i>) [A137]            Golden Plover (<i>Pluvialis apricaria</i>) [A140]            Lapwing (<i>Vanellus vanellus</i>) [A142]            Dunlin (<i>Calidris alpina</i>) [A149]</p>

European Site	Qualifying Interests
	Bar-tailed Godwit ( <i>Limosa lapponica</i> ) [A157] Curlew ( <i>Numenius arquata</i> ) [A160] Redshank ( <i>Tringa totanus</i> ) [A162] Turnstone ( <i>Arenaria interpres</i> ) [A169] Black-headed Gull ( <i>Chroicocephalus ridibundus</i> ) [A179] Common Gull ( <i>Larus canus</i> ) [A182] Sandwich Tern ( <i>Sterna sandvicensis</i> ) [A191] Common Tern ( <i>Sterna hirundo</i> ) [A193] Wetlands & Waterbirds [A999]
Galway Bay Complex SAC This large site includes a diverse range of marine, coastal and terrestrial habitats including saltmarsh, coastal lagoons, turloughs, fens and grasslands. It also supports a common seal colony, a breeding otter population and four red data book plant species. Distance: 10 km northwest	Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons* [1150] Large shallow inlets and bays [1160] Reefs [1170] Perennial vegetation of stony banks [1220] (Salicornia) and other annuals colonizing mud and sand [1310] Atlantic salt meadows (Glauco-Puccinellietalia maritima) [1330] Otter ( <i>Lutra lutra</i> ) [1355] Common seal ( <i>Phoca vitulina</i> ) [1365] Mediterranean salt meadows (Juncetalia maritimi) [1410] Turloughs* [3180] (Juniperus communis) formations on heaths or calcareous grasslands [5130] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia)(*important orchid sites) [6210] Calcareous fens with ( <i>Cladium mariscus</i> ) and species of the Caricion davallianae* [7210] Alkaline fens [7230]
Caherglassaun Turlough SAC This site is notable for its pronounced 'tidal' fluctuation and its complement of rare plants and animals. There is also a roost for Lesser horseshoe bat. Distance: 5 km NW	Lesser horseshoe bat ( <i>Rhinolophus hipposideros</i> ) [1303] Turloughs [3180]
Ballinduff Turlough SAC Site supports a wide range of turlough habitats. The presence of the shoreweed <i>Littorella uniflora</i> is notable. Distance: 7 km north	Turloughs [3180]
Cahermore Turlough SAC This site supports a wide range of turlough habitats with well-developed plant communities. The amount and quality of the developing woodland is a special feature of this turlough. Distance: 6.5km NE	Turloughs [3180]
Peterswell Turlough SAC This is a large and important site which shows an excellent range of vegetation along the turlough-callow	Turloughs [3180]



European Site	Qualifying Interests
<p>gradient and includes a summer-dry turlough filled by a river. Distance 8km NE</p>	
<p>Carrowbaun, Newhall &amp; Ballylee Turloughs SAC The vegetation of Carrowbaun, Newhall and Ballylee has been largely modified by drainage works, fertilization and over-grazing, which reduce their botanical value. However, the wet plant communities in north Carrowbaun and the turlough scrub are important botanically. The presence of a high diversity of waterbirds and the roost of Lesser horseshoe bats adds to the ecological interest of the site. Distance: 7.1 km south</p>	<p>Turloughs [3180]</p>
<p>Lough Coy SAC Lough Coy is an excellent example of a eutrophic (nutrient-rich) turlough. The extreme water fluctuation supports a distinctive zonation of vegetation and provides many niches for specialist plants. It is an important site for wintering waterfowl. Distance: 7.1 kmNE</p>	<p>Turloughs [3180]</p>
<p>Slieve Aughty Mountains SPA This large site comprises a range of upland habitats. It is a stronghold for hen harrier and supports the second largest concentration in the country. It also supports a breeding population of Merlin. Distance: 8.3 km E</p>	<p>Hen Harrier (<i>Circus cyaneus</i>) [A082] Merlin (<i>Falco columbarius</i>) [A098]</p>
<p>East Burren Complex SAC &amp; pNHA This large site incorporates all of the high ground in the east Burren in Counties Clare and Galway and extends south-eastwards to include a complex of calcareous wetlands. The area encompasses a range of limestone habitats that include limestone pavement and associated calcareous grasslands and heath, scrub and woodland together with a network of calcareous lakes and turloughs. The site exhibits some of the best and most extensive areas of oligotrophic limestone wetlands to be found in the Burren and in Europe. Distance: 10 km southwest</p>	<p>Marsh fritillary (<i>Euphydryas aurinia</i>) [1065] Lesser horseshoe bat (<i>Rhinolophus hipposideros</i>) [1303] Otter (<i>Lutra lutra</i>) [1355] Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp. [3140] Turloughs [3180] Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation [3260] Alpine and Boreal heaths [4060] <i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia)(*important orchid sites) [6210] Lowland hay meadows (<i>Alopecurus pratensis</i>, <i>Sanguisorba officinalis</i>) [6510] Calcareous fens with <i>Cladium mariscus</i> and species of the Caricion davallianae [7210] Petrifying springs with tufa formation (Cratoneurion) [7220] Alkaline fens [7230] Limestone pavements [8240] Caves not open to the public [8310]</p>

European Site	Qualifying Interests
	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> ) [91E0]
<p>Sonnagh Bog SAC Sonnagh Bog is important as a good example of an intact, lightly grazed, highland blanket bog. Distance: 11.4 km east</p>	Blanket bog (*active only) [7130]
<p>Lough Cutra SAC Lough Cutra is a large oligo/mesotrophic freshwater lake lying on limestone, but with much sediment washed down from the sandstone hills above. This lake is situated about 4 km south-east of Gort, Co. Galway. A series of connected woodlands on the western side of the lake has been included as foraging habitat for the Lesser horseshoe bats which roost at the site. Distance: 4.1 E</p>	Lesser horseshoe bat ( <i>Rhinolophus hipposideros</i> ) [1303]
<p>Lough Cutra SPA This site is of particular importance for its long-established breeding colony of Cormorant. It is of regional importance for wintering waterfowl. The regular occurrence of Whooper Swan, albeit in low numbers, is of note. Distance: 4.1 km E</p>	Cormorant ( <i>Phalacrocorax carbo</i> ) [A017]
<p>Lough Rea SAC Lough Rea is a hard water lake fed by springs and a stream. Some stoneworts have been recorded from the site. Distance: 17 km NE</p>	Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp. [3140]
<p>Lough Rea SPA Lough Rea is an important ornithological site for the nationally important populations of Shoveler and Coot, and regionally/locally important populations of a further ten species that it holds. Distance: 17 km NE</p>	Shoveler ( <i>Anas clypeata</i> ) [A056] Coot ( <i>Fulica atra</i> ) [A125] Wetlands & Waterbirds [A999]
<p>Termon Lough SAC It consists of a series of three turloughs, with low, drift-covered slopes on all sides except in the north-east, where a small area of limestone pavement is found. The turloughs are hydrologically linked at times of high water. Distance: 14.7 km south</p>	Turloughs [3180]

#### 4.7 POTENTIAL ADVERSE EFFECTS ON EUROPEAN SITES

This section documents the final stage of the Stage 1 Screening process. It is vital that an assessment of potential source-pathway-receptor links is undertaken to assess potential impact links between the receptor (European Sites) and source (Substitute Consent site) to establish the risk of any likely significant effects. It used the information collected on the sensitivity of the Qualifying Interests of each European Site and describes any likely significant effects from the construction, operation and

decommissioning stages of the development. This assumes the absence of mitigation measures with the exception of those incorporated in the design stage as good practice such as avoidance.

The Stage 1 Screening identified likely significant effects of the development both in isolation and potentially in combination with other plans or projects (Table 3). These potential impacts are summarised below and have been addressed in more detail in Stage 2 of the NIS for those sites where the potential for significant adverse effects have been identified.

#### *4.7.1 Potential for Direct Impacts*

Taking account of the separation distance between the Substitute Consent site and the closest Natura 2000 sites, the East Burren Complex SAC is located approximately 900m to the west, with respect to the qualifying interests of these designations within the study area, there is no potential for direct impacts affecting any European Site.

#### *4.7.2 Potential for Indirect Impacts*

Potential indirect impacts arising from the Substitute Consent site are identified with respect to the qualifying interests of designated European sites and their qualifying interests. Taking account of the size and scale of the Substitute Consent site, and an examination of the pathways for potential indirect impacts, as set out below, a number of Natura 2000 sites included in Table 1 above have been screened out. These sites include marine and coastal SACs and SPAs; terrestrial SPAs at a distance from the Substitute Consent site; and aquatic and terrestrial SACs which occur at a distance or outside of the surface water and groundwater body of the Substitute Consent site.. The following indirect effects arising from the development are considered as follows:

- Dust and other emissions from vehicles/machinery arising from the quarry during operation. This equipment for the processing of stone from the quarry and to transport the material for use;
- Personnel vehicles;
- Noise from vehicles/machinery (detailed above);
- Inappropriate lighting at Quarry Extension impacting nocturnal foraging species such as bats;
- Uncontrolled emissions to surface water or groundwater (from Substitute Consent site) impacting sensitive aquatic receptors;
- Introduction and/or spread of non-native invasive species within the Substitute Consent site, extending to roadside and designated European Sites.

The site synopses for each of the European Sites considered below are included in Appendix C. Potential indirect impacts arising from the development are identified with respect to the Source-Pathway-Receptor Model. Taking account of the size and scale of the Substitute Consent site, as well as the distance to the nearest designated European Site, a number of the pathways for potential indirect impacts have been screened out, as discussed below.

#### **Dust and Air Quality;**

Emissions from construction vehicles and machinery, and the deposition of particulate matter (PM) and heavy metals produced by engine, brake and tyre wear can contribute to increased deposition of pollutants such as oxides of nitrogen (NO<sub>x</sub>, NO<sub>3</sub>), volatile organic compounds (VOCs), PM, heavy metals, and ammonia (NH<sub>4</sub>) in the vicinity of the development. This can affect the ecosystems and

vegetation present, influencing plant growth rates and species composition, diversity and abundance. Dust emissions associated with construction works could, in extreme circumstances, affect adjoining habitats (potentially burying sensitive habitat or plant species). The effects of air pollution on vegetation and habitats are generally greatest within 50 to 100m of a road carriageway for instance but effects can extend up to 200m (NRA 2011); it is expected this would be significantly lower due to the scale of the project compared to a national road scheme. It is noted in the DoEHLG (2004) Quarry guidelines that the most severe dust conditions are likely to be experienced within about 100m of the dust source, with potential effects extending 0.5km from the source<sup>27</sup>.

Given the prevailing winds at the site are generally from a south westerly direction and that the nearest designated European Site is approximately 0.5 km west and south of the development, significant impacts are unlikely to have occurred as a result of dust. Results from similar rural areas are below Statutory Limits for Particulate matter (50 µg/m<sup>3</sup>).

**Noise** caused by activities/machinery and personnel/vehicle movements during construction and operational phases were unlikely to cause a significant impact to designated European Sites as they are all sufficiently removed. Given that habitats are not impacted by noise disturbance, the only designated European Sites containing qualifying Interests are 0.9 km away. Noise at the facility would be inaudible at a distance of 0.9 km.

Bird Species can be sensitive to disturbance, potentially displacing within 100m to 200m of people and responding to vehicular traffic at 200m to 250m, although birds generally immediately re-settled elsewhere. Peregrine Falcons frequently utilise and nest in active Quarries and are unlikely to be significantly affected by noise.

Noise levels associated with typical construction activity have been calculated in accordance with the methodology set out in BS 5228:2009 'Code of Practice for Noise and Vibration Control on Construction and Open Sites - Part 1 Noise'. This standard sets out sound power levels for plant items normally encountered on construction sites, which in turn enables the prediction of noise levels. A variety of items of plant were in use. These included excavators, trucks and generators. The key phases of works involved site clearing and preparation, excavations. None of the construction activities listed above would be expected to result in any more than a moderate level of disturbance effect on waterbirds at distances beyond 100m. Due to the existing roads and activity it is unlikely that any protected bird species utilised the site.

**Lighting** can impact nocturnal foraging species such as bats. Based on the normal foraging distance of 2.5km as per the conservation objectives, significant effects cannot be ruled out.

There was some artificial lighting associated with the works during the opening hours, however these did not coincide with active times for Bats (Early November to Feb). Lighting in winter were minimal and overspill of light were minimised through directional lighting (i.e., aimed directly onto the site and not the wider landscape) so as to leave the areas outside of the footprint unilluminated. The use of cowls, lighting hoods, or louvres fitted to the rear of luminaries, and/or shields to direct light in a downwards and inwards fashion to intended areas only.

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<sup>27</sup><http://www.housing.gov.ie/sites/default/files/migratedfiles/en/Publications/DevelopmentandHousing/Planning/FileDownload,1606,en.pdf>

#### *4.7.3 Potential In-Combination Effects*

The Galway County Council planning website was reviewed for any significant developments in planning in the vicinity of the development at the Ballysheedy Quarry site. No other developments in planning were identified as having potential to result in cumulative effects with the development, taking account of the nature of the previous works, located within the existing Ballysheedy Quarry site and the absence of interactions with other plans or projects. No plans with the potential for significant in-combination/cumulative effects with the development were identified. The county and regional development plans promote sustainable development and include policies and objectives aimed at protecting the natural environment and implementing the requirements of the E.U. Habitats and Birds Directives.

The M18 Motorway scheme passes ca. 1km to the east of Ballysheedy Quarry site. The construction of this road scheme was completed in 2010/2011 during the operational phase of the quarry. The substitute consent site addressed in combination impacts from the M18 construction site, which does not include quarry excavation, did not interact with the potential impacts identified with respect to the road development; therefore, potential interactions leading to cumulative impacts which may affect the qualifying interests of the designated sites have not been identified.

**Table 3: Screening Impact Assessment of European Sites and their Qualifying Interests**

European Site	Qualifying Interests	Description of potential impacts from the development	Potential for significant adverse Project effects?	Potential for significant adverse in-combination effects?
East Burren Complex SAC 550mWest	<p>Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140] Turloughs [3180] Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation [3260] Alpine and Boreal heaths [4060] Juniperus communis formations on heaths or calcareous grasslands [5130] Calaminarian grasslands of the Violetalia calaminariae [6130] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510] Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7210] Petrifying springs with tufa formation (Cratoneurion) [7220] Alkaline fens [7230] Limestone pavements [8240] Caves not open to the public [8310] Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] Euphydryas aurinia (Marsh Fritillary) [1065] Rhinolophus hipposideros (Lesser Horseshoe Bat) [1303] Lutra lutra (Otter) [1355]</p>	<p>The existing quarry and groundwater connection at the site gives rise to the potential for groundwater quality impacts with respect to turlough habitats. Terrestrial habitats within the SAC closest proximity to the site (broadleaved woodland) could not be impacted by dust emissions.</p>	<p>Pathways for potential impacts identified.</p>	<p>With the exception of groundwater interactions, pathways for in-combination effects limited and not considered significant.</p>

European Site	Qualifying Interests	Description of potential impacts from the development	Potential for significant adverse Project effects?	Potential for significant adverse in-combination effects?
Lough Cutra SAC Site Code: 000299) (4.1km E)	Alpine and Boreal heaths [4060] Juniperus communis formations on heaths or calcareous grasslands [5130] Limestone pavements [8240]	Terrestrial habitats for which this site is designated are not likely to be significantly affected. No hydrological connection	No pathways for potential significant adverse effects	No pathways for potential significant adverse effects
Termon Lough SAC 650m South	Turloughs [3180]	Terrestrial habitats for which this site is designated are not likely to be significantly affected. No hydrological connection	No Pathways for potential impacts identified.	No pathways for potential significant adverse effects.
Coole Garryland Complex SAC (Site Code: 000252) (1.2km NW, 1.6km N)	Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation [3150] Turloughs [3180] Rivers with muddy banks with Chenopodium rubri p.p. and Bidention p.p. vegetation [3270] Juniperus communis formations on heaths or calcareous grasslands [5130] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia)(*important orchid sites) [6210] Limestone pavements [8240]	The existing quarry and groundwater connection at the site gives rise to the potential for groundwater quality impacts with respect to turlough habitats.	Potential indirect pathway	With the exception of groundwater interactions, pathways for in-combination effects limited and not considered significant. Potential pathway in terms of groundwater connection
Lough Fingall Complex SAC (Site Code: 000606) (12.9km N)	Lesser horseshoe bat (Rhinolophus hipposideros) [1303] Turloughs [3180] Alpine and Boreal heaths [4060] Juniperus communis formations on heaths or calcareous grasslands [5130] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia)(*important orchid sites) [6210] Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7210] Limestone pavements [8240]	Terrestrial habitats for which this site is designated are not likely to be significantly affected. No hydrological connection	No Pathways for potential impacts identified .	No pathways for potential significant adverse effects.
Ballinduff Turlough SAC (Site Code: 002295) (7.3km N)	Turloughs [3180]	The development does not give rise to pathways for impacts due to the distance of separation. Groundwater flows are not in the direction of the Turlough.	No pathways for potential significant adverse effects	No pathways for potential significant adverse effects

European Site	Qualifying Interests	Description of potential impacts from the development	Potential for significant adverse Project effects?	Potential for significant adverse in-combination effects?
Cahermore Turlough SAC (Site Code: 002294) (7.1km N)	Turloughs [3180]	The development does not give rise to pathways for impacts due to the distance of separation. Groundwater flows are not in the direction of the Turlough.	No pathways for potential significant adverse effects	No pathways for potential significant adverse effects
Peterswell Turlough SAC (Site Code: 000318) (9.8km NE)	Turloughs [3180]	The development does not give rise to pathways for impacts due to the distance of separation. Groundwater flows are not in the direction of the Turlough.	No pathways for potential significant adverse effects	No pathways for potential significant adverse effects
Carrowbaun, Newhall & Ballylee Turloughs SAC (Site Code: 002293) (6.9km NE)	Turloughs [3180]	The development does not give rise to pathways for impacts due to the distance of separation. Groundwater flows are not in the direction of the Turlough.	No pathways for potential significant adverse effects	No pathways for potential significant adverse effects
Lough Coy SAC (Site Code: 002117) (7.7km NE)	Turloughs [3180]	The development does not give rise to pathways for impacts due to the distance of separation. Groundwater flows are not in the direction of the Turlough.	No pathways for potential significant adverse effects	No pathways for potential significant adverse effects
Caherglassaun Turlough SAC (Site Code: 000238) (5.6km NW)	Lesser horseshoe bat ( <i>Rhinolophus hipposideros</i> ) [1303] Turloughs [3180]	The Lesser horseshoe bat roost sites within this SAC is over 6km from the development (Bat Conservation Ireland, 2012). Groundwater flows are not in the direction connection with the Turlough.	Potential indirect pathway	With the exception of groundwater interactions, pathways for in-combination effects limited and not considered significant. Potential pathway in terms of groundwater connection
Gortacarnaun Wood SAC (Site Code: 002180) (7.3km E)	Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]	No potential for impacts on woodland over 5km from the site	No pathways for potential significant adverse effects	No pathways for potential significant adverse effects



European Site	Qualifying Interests	Description of potential impacts from the development	Potential for significant adverse Project effects?	Potential for significant adverse in-combination effects?
Drummin Wood SAC (Site Code: 002181) (7.7km E)	Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]	No potential for impacts on woodland over 5km from the site	No pathways for potential significant adverse effects	No pathways for potential significant adverse effects
Ballyogan Lough SAC (Site Code: 000019) (8.1km SW)	Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7210] Limestone pavements [8240]	The development does not give rise to pathways for impacts due to the distance of separation. Groundwater flows are not in the direction of the Turlough.	No pathways for potential significant adverse effects	No pathways for potential significant adverse effects
Moyree River System SAC (Site Code: 000057) (8.4km S)	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation [3260] Alkaline fens [7230] Limestone pavements [8240] Caves not open to the public [8310] Rhinolophus hipposideros (Lesser Horseshoe Bat) [1303] Lutra lutra (Otter) [1355]	The development does not give rise to pathways for impacts due to the distance of separation. Groundwater flows are not in the direction of the SAC.	No pathways for potential significant adverse effects	No pathways for potential significant adverse effects
Galway Bay Complex SAC (Site Code: 000268) (11.1km NW)	Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons [1150] Large shallow inlets and bays [1160] Reefs [1170] Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] Mediterranean salt meadows (Juncetalia maritimi) [1410] Turloughs [3180] Juniperus communis formations on heaths or calcareous grasslands [5130]	The development does not give rise to pathways for impacts due to the distance of separation and infinite dilution in the coastal SAC. No connection to Ballinderreen Lough, Ballinacourty Turlough, Ballyvelaghan Lough or Lough Rask	No pathways for potential significant adverse effects	No pathways for potential significant adverse effects

European Site	Qualifying Interests	Description of potential impacts from the development	Potential for significant adverse Project effects?	Potential for significant adverse in-combination effects?
	<p>Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]            Calcareous fens with Cladium mariscus and species of the Caricion davalliana [7210]            Alkaline fens [7230]            Limestone pavements [8240]            Lutra lutra (Otter) [1355]            Phoca vitulina (Harbour Seal) [1365]</p>			
<p>Ardrahan Grassland SAC (Site Code: 002244) (11.5km N)</p>	<p>Alpine and Boreal heaths [4060]            Juniperus communis formations on heaths or calcareous grasslands [5130]            Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]            Limestone pavements [8240]</p>	<p>The development does not give rise to pathways for impacts due to the distance of separation. No hydrological connection.</p>	<p>No pathways for potential significant adverse effects</p>	<p>No pathways for potential significant adverse effects</p>
<p>Dromore Woods &amp; Loughs SAC (Site Code: 000032) (12.5km SW)</p>	<p>Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation [3150]            Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]            Limestone pavements [8240]            Rhinolophus hipposideros (Lesser Horseshoe Bat) [1303]            Lutra lutra (Otter) [1355]</p>	<p>The development does not give rise to pathways for impacts due to the distance of separation. Groundwater flows are not in the direction of the SAC. No hydrological connection.</p>	<p>No pathways for potential significant adverse effects</p>	<p>No pathways for potential significant adverse effects</p>
<p>Gleendree Bog SAC (Site Code: 001912) (13km SE)</p>	<p>Blanket bogs (* if active bog) [7130]</p>	<p>No potential for terrestrial or hydrological connection with the Bog. No hydrological connection.</p>	<p>No pathways for potential significant adverse effects</p>	<p>No pathways for potential significant adverse effects</p>
<p>Kiltiernan Turlough SAC (Site Code: 001285) (13.4km N)</p>	<p>Turloughs [3180]</p>	<p>The development does not give rise to pathways for impacts due to the distance of separation. Groundwater flows are not in the direction of the SAC. No hydrological connection.</p>	<p>No pathways for potential significant adverse effects</p>	<p>No pathways for potential significant adverse effects</p>

European Site	Qualifying Interests	Description of potential impacts from the development	Potential for significant adverse Project effects?	Potential for significant adverse in-combination effects?
Castletaylor Complex SAC (Site Code: 000242) (14.2km N)	Turloughs [3180] Alpine and Boreal heaths [4060] Juniperus communis formations on heaths or calcareous grasslands [5130] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] Limestone pavements [8240]	The development does not give rise to pathways for impacts due to the distance of separation. Groundwater flows are not in the direction of the SAC. No hydrological connection.	No pathways for potential significant adverse effects	No pathways for potential significant adverse effects
Inner Galway Bay SPA (Site Code: 004031) (11.1km NW)	Black-throated Diver ( <i>Gavia arctica</i> ) [A002] Great Northern Diver ( <i>Gavia immer</i> ) [A003] Cormorant ( <i>Phalacrocorax carbo</i> ) [A017] Grey Heron ( <i>Ardea cinerea</i> ) [A028] Light-bellied Brent Goose ( <i>Branta bernicla hrota</i> ) [A046] Wigeon ( <i>Anas penelope</i> ) [A050] Teal ( <i>Anas crecca</i> ) [A052] Red-breasted Merganser ( <i>Mergus serrator</i> ) [A069] Ringed Plover ( <i>Charadrius hiaticula</i> ) [A137] Golden Plover ( <i>Pluvialis apricaria</i> ) [A140] Lapwing ( <i>Vanellus vanellus</i> ) [A142] Dunlin ( <i>Calidris alpina</i> ) [A149] Bar-tailed Godwit ( <i>Limosa lapponica</i> ) [A157] Curlew ( <i>Numenius arquata</i> ) [A160] Redshank ( <i>Tringa totanus</i> ) [A162] Turnstone ( <i>Arenaria interpres</i> ) [A169] Black-headed Gull ( <i>Chroicocephalus ridibundus</i> ) [A179] Common Gull ( <i>Larus canus</i> ) [A182] Sandwich Tern ( <i>Sterna sandvicensis</i> ) [A191] Common Tern ( <i>Sterna hirundo</i> ) [A193] Wetland and Waterbirds [A999]	The development does not give rise to pathways for impacts due to the distance of separation. The development does not give rise to pathways for impacts due to the distance of separation and infinite dilution in the coastal SAC. No connection to Ballinderreen Lough, Ballinacourty Turlough, Ballyvelaghan Lough or Lough Rask	No pathways for potential significant adverse effects	No pathways for potential significant adverse effects
Slieve Aughty Mountains SPA (Site Code: 004168) (6.1km E)	Hen Harrier ( <i>Circus cyaneus</i> ) [A082] Merlin ( <i>Falco columbarius</i> ) [A098]	The development does not give rise to pathways for impacts due to the distance of separation. No suitable habitat.	No pathways for potential significant adverse effects	No pathways for potential significant adverse effects

European Site	Qualifying Interests	Description of potential impacts from the development	Potential for significant adverse Project effects?	Potential for significant adverse in-combination effects?
Corofin Wetlands SPA (Site Code: 004220) (13km SW)	Little Grebe ( <i>Tachybaptus ruficollis</i> ) [A004] Whooper Swan ( <i>Cygnus cygnus</i> ) [A038] Wigeon ( <i>Anas penelope</i> ) [A050] Teal ( <i>Anas crecca</i> ) [A052] Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156] Wetland and Waterbirds [A999]	The development does not give rise to pathways for impacts due to the distance of separation. No suitable habitat.	No pathways for potential significant adverse effects	No pathways for potential significant adverse effects

## 4.8 STAGE 1 SCREENING CONCLUSION

Following an evaluation of the relevant information, including in particular the Substitute Consent project, its relationship with European sites and lack of consideration for protective measures of the natural environment, as well as providing the precautionary principle, it is not considered possible to rule out the possibility of significant effects on

- East Burren Complex SAC;
- Caherglassaun SAC: and
- Coole Garryland Complex SAC;

It is therefore recommended that a Natura Impact Statement be prepared to assist the competent authority in undertaking an Appropriate Assessment of the effects of this upgrade project alone or in-combination with other plans and projects, on the integrity of the Caherglassuan, East Burren Complex SAC, and Coole Garryland SAC.

## 5 STAGE 2 APPROPRIATE ASSESSMENT

### 5.1 INTRODUCTION

This stage of the AA process, often referred to as Stage 2, assesses potential impacts of the development on the integrity of designated Natura 2000 sites, with respect to their conservation objectives i.e., structure and function. Where required, mitigation measures are applied in order to avoid or minimise the risk. The AA Screening identified designated sites within the wider study area and concluded that groundwater connectivity and potential disturbance arising from the development gave rise to the *potential* for significant adverse effects on the following designated Natura 2000 sites:

- East Burren Complex SAC;
- Coole Garryland Complex SAC
- Caherglassaun SAC;

#### 5.1.1 *Impact Characteristics and Evaluation*

Potential impacts arising from the development, alone or in combination with other plans or project, are evaluated with respect to the Qualifying Interests of the designated sites within the zone of influence. The Ecological Impact Assessment of potential impacts on European Sites is conducted utilising a standard Source-Receptor-Pathway model; where, all three elements of this mechanism must be in place to establish an impact arising. In addition, in line with the Appropriate Assessment process (EC, 2001; DOEHLG, 2010) mitigation has been discussed and applied to each potential impact in order to ensure that the development, individually or in combination with other plans or projects, will not have a significant effect on, or adversely affect the integrity of any European Site. The following parameters are described when characterising ecological impacts:

- Direct and Indirect Impacts - An impact can be caused either as a direct or as an indirect consequence of a development.
- Magnitude - Magnitude measures the size of an impact, which is described as high, medium, low, very low or negligible.
- Extent - The area over which the impact occurs - this should be predicted in a quantified manner.
- Duration - The time for which the effect is expected to last prior to recovery or replacement of the resource or feature.
  - Temporary: Up to 1 Year;
  - Short Term: The effects would take 1-7 years to be mitigated;
  - Medium Term: The effects would take 7-15 years to be mitigated;
  - Long Term: The effects would take 15-60 years to be mitigated;
  - Permanent: The effects would take 60+ years to be mitigated.
- Likelihood:
  - Certain/Near Certain: >95% chance of occurring as predicted;
  - Probable: 50-95% chance as occurring as predicted;
  - Unlikely: 5-50% chance as occurring as predicted;
  - Extremely Unlikely: <5% chance as occurring as predicted.

## 5.2 RECEIVING ENVIRONMENT

### 5.2.1 Habitats

The existing Substitute Consent area comprise bare ground, spoil heaps and adjacent works areas. There is limited natural vegetation on the quarry site where single-sized processed material exists i.e., some stockpiles however vegetation of the former stockpiles to the north of the substitute consent area is advanced. Boundary hedgerows are in place at the site. In the Substitute Consent area, recolonisation of the quarry faces with ruderal calciphiles is occurring. Succession is more advanced on the upper benches, with gorse and hazel scrub developing.

With the exception of the quarry floor, there are no permanent surface water features on the site. A total of 8 No. principal habitat classes and habitat mosaics (mix of habitat classes) were identified within the Study Area including:

- Hedgerows (WL1);
- Scrub (WS1);
- Spoil and Bare Ground (ED2);
- Re-colonising Bare Ground (ED3);
- Buildings and Artificial Surfaces (BL3); and
- Other Artificial Lakes and Ponds (FL8).

The principal habitat classes and their extents are presented on Figure 4 (which occurred in narrow marginal strips) and described below.

### 5.2.2 Hedgerows WL1

The hedgerow habitats within the site include stone walls and comprise species including whitebeam *Sorbus aria*, ash *Fraxinus excelsior*, hazel *Corylus avellana* and holly *Ilex aquifolium*, common gorse *Ulex europaeus*, hawthorn *Crataegus monogyna* and bramble *Rubus fruticosus agg.*

### 5.2.3 Spoil and Bare ground ED2 / Exposed Sand, Gravel and Till ED1

The habitat extends over much of the former works area and includes limestone spoil and a large, excavated steep-sided pit that is largely devoid of vegetation.

### 5.2.4 Recolonising Bare Ground ED3

In places such as some spoil heaps and along track edges extending around the quarry void, vegetation is more abundant and recolonisation has advanced. In these places common species include red clover *Trifolium pratense*, ribwort plantain *Plantago lanceolata*, yarrow *Achillea millefolium*, silverweed *Argentina anserina*, biting stonecrop *Sedum acre*, common knapweed *Centaurea nigra*, common centaury *Centaureum erythraea*, smooth hawksbeard *Crepis capillaris*, wild carrot *Daucus carota* and rough hawkbit *Leontodon hispidus*.

### 5.2.5 Buildings and Artificial Surfaces BL3

This habitat is used to describe the existing site entrance, existing weighbridge, existing site office & existing wheelwash, and existing concrete, all to the east of the substitute consent area. These areas are not of ecological value.

### 5.2.6 Scrub WS1

Dense hazel *Corylus avellana* scrub, a former coppice woodland, is located outside the site boundary. Other species established mainly around the periphery of this area between the hazel and tracks include blackthorn *Prunus spinosa*, hawthorn *Crataegus monogyna*, bramble *Rubus fruticosus* agg., willow *Salix* spp. Elsewhere gorse *Ulex europaeus* scrub occurs around the quarry boundaries.

### 5.2.7 Other artificial lakes and ponds FL8;

This habitat classification is used to describe the lower bench of the quarry pit (within Substitute Consent area/Regeneration area). The pond does not vary greatly in level. While the flooded void does not contain much vegetation, *Chara* spp. was noted in the quarry void.

The quarry floor comprises a permanent water body. The water body has established at approximately 29mOD, significantly above the natural water level in the surrounding wetland/marsh areas including the Newtown (<10mOD) 1km to the east and Drumminacloghaun areas 0.3 km to the north. Groundwater flow is to the northeast. No karst conduits occur on site

### 5.2.8 Fauna

#### 5.2.9 Mammals

Evidence of fox (scat and tracks) and hare (*Lepus timidus hibernicus*) was observed during the Ecological Field Surveys. No other sightings or traces of mammals were observed on site. However, given the environment and habitats present, other mammals likely to use the quarry at least for foraging purposes include species common in the Irish countryside such as Badger (*Meles meles*); Hedgehog (*Erinaceus europaeus*); Pine marten (*Martes martes*) and Stoat (*Mustela erminea*).

The closest pine marten (*Martes martes*) record to the site is ca. 4 km northwest of the Study Area (NBDC database). Badger, hedgehog, pine marten, stoat and Hare are protected under Section 23 of the Wildlife Act as amended (2000).

Lesser Horseshoe Bat roosts exist at a number of sites in the region, the closest being ca. 1km to the south of the site, and within East Burren Complex SAC to the west of the site (source - NPWS data request - exact locations confidential). Lesser horseshoe bat is protected under Annex II of the E.U. Habitats Directive. All bat species are protected under Annex IV of the E.U. Habitats Directive and under Section 23 of the Wildlife Act as amended (2000). No sites suitable as roost sites exist within the quarry for this or any other bat species.

#### 5.2.10 Birds

A pair of Peregrine falcons (*Falco peregrinus*) were sighted at the Ballysheedy Quarry site in August 2019, May 2020 and May 2022. A nest site was located during this survey to the south of the wildlife refuge. Peregrine Falcons is listed on Annex I species of the Birds Directive and are an amber listed species of moderate conservation concern. The cliff faces of the former quarry void are suitable habitat for these species.

Other more common birds noted on site during the Ecological Field Surveys included:

- Chiffchaff;



- Coal Tit;
- Dunnock;
- Great tit;
- Greenfinch;
- Linnet;
- Rook;
- Robin;
- Blackbird;
- Mistle Thrush;
- Wagtail;
- Wood Pigeon;
- Wren; and
- Willow warbler;

All birds and their nesting places are protected under the Irish Wildlife Act (1976), and under the Irish Wildlife Amendment Act, (2000) (except for excluded species). All birds and their nests are protected during the breeding season (with certain excepted species) under the Irish Wildlife Acts. The retention of boundary scrub/ and woodland areas will limit disturbance and habitat loss for bird species.

#### Bat Surveys

Lesser Horseshoe Bat roosts exist at a number of sites close to the quarry including at Termon Lough SAC (<1.1km south of the quarry boundary). Lesser Horseshoe Bat are protected under Annex IV of the Habitats Directive in Europe. No sites suitable as roost sites exist at the quarry. There were no caves/suitable cavities encountered on the at any stage of the development.

Bat surveys included an assessment of suitable bat roost sites/habitats within the site and adjacent habitats. A nocturnal bat activity survey was conducted on 10<sup>th</sup> July 2008, 6<sup>th</sup> July 2020 and 17<sup>th</sup> June 2022 by an experienced bat surveyor, familiar with vocal and visual (dusk) signs of bat activity and species identification, including Lesser horseshoe bat (*Rhinolophus hipposideros*). Conditions were suitable for survey (calm, mild and at time of year when bat activity would be detectable). Bats were identified by their ultrasonic calls using a 'Echometer EM3+' ultrasonic recorder coupled with behavioural and flight observations. This recorder allows review of spectrograms in real time and recording of bat ultrasounds for more detailed analysis. The EM3+ allows a user selectable sample rate of 384kHz, the recommended option in areas where Lesser horseshoe bats may be present. The focus of the survey was to detect presence of all bat species, in particular Lesser horseshoe bat (*Rhinolophus hipposideros*), as this species is protected under Annex II and Annex IV of the Habitats Directive and is a qualifying interest of designated conservation sites within the wider study area. Bat activity surveys were conducted as follows:

- The Study Area was surveyed by foot with a heterodyne bat detector (Batbox), where access allowed;
- A 15 minute static activity survey was carried out at each of 3 No. locations within the Sheeaun Quarry site;
- Fringing Hazel scrub and remnants within the Study Area were surveyed;

- The roadways to the south of the Sheeaun Quarry site were driven with the bat detector so as to record any signs of bat activity<sup>28</sup>.

The presence of lesser horseshoe bat within and surrounding the development may result in the impact of the populations of this species in East Burren Complex SAC, where the lesser horseshoe bat is a Qualifying Interest species. However, the development is not expected to impact on the populations and roosts for which the SACs are designated. East Burren Complex SAC has been selected for lesser horseshoe bats because of the presence of two known nursery roosts, a transition roost and four known winter sites, the latter all in natural limestone caves. There are no known roosts on the site. Lesser horseshoe bats core foraging range is 2.5km from their roosts. The site is located >2km from roosts outside the East Burren SAC

Other summer roosts for the lesser horseshoe bat (an Annex II and Annex IV species), did occur within 2km of the development.

#### *5.2.11 Hydrology, Hydrogeology and Water Quality*

Information on hydrology and hydrogeology presented below was compiled by a qualified TOBIN hydrogeologist and is based on a review of existing information (2001 EIS), GSI and EPA data and mapping, site visit observations, the Gort Flood Studies Project and water quality sampling.

Groundwater and surface water flow systems within the Gort Lowlands are closely linked due to the highly-karstified nature of the limestone bedrock, with large volumes of water exchanged between the surface and subsurface throughout the catchment (Drew 2008). The exchange of water between the bedrock and the land surface largely occurs in low-lying basins known as turloughs. Many of these turloughs are important Groundwater Dependent Terrestrial Ecosystem (GWDTEs) and are protected under the EU Habitats Directive (Regan et al. 2007). The relationship between many of these turloughs and the underground/overland flow systems which exist between them has been the subject of much research (Kinahan 1865; Praeger 1932; Williams 1964, Gill, 2013 and Morrissey et al, 2018).

A number of interconnected turloughs, stream and lakes in the Gort lowlands eventually discharge to Coole- Garryland and from there to the coast at Kinvara (Galway Bay). A number of these turloughs are located upgradient of the site including Blackrock Turlough, Lough Coy, Lough Cutra and the Gort River. The site is located in the Caherglassaun Turlough groundwater body - GWDT-E-Caherglassaun Turlough (SAC000238).

Closer to the site the surface water network comprises a number of partially drained wetlands 0.3 to 1km to the north and west respectively. These wetlands/discharge to the Coole Garryland Complex SAC. Based on the groundwater levels, groundwater flow is towards the wetland to the north and the Coole Lough Area. It is thought that the water in the Substitute Consent area/Regeneration area discharges to the wetland.

The recorded level in the flooded void in recent years is 29mOD and 29.9mOD. Water levels in Coole are between 6 and 14mOD. With limited inflows/outflows apart from intercepted shallow

<sup>28</sup>Roche, N., Langton, S. and Aughney T. (2012) Car-based bat monitoring in Ireland 2003-2011. Irish Wildlife Manuals, No. 60. National Parks and Wildlife Service, Department of the Arts, Heritage and the Gaeltacht, Ireland.

groundwater flow, water level in the flooded Substitute Consent area is stable. Based on water level monitoring, water levels do not rise and fall significantly which indicates that:

- There is no connection at regional groundwater conduits in the flooded area, and
- There is an upper control in the karst

To the south and south west surface water features are limited. Groundwater flow in the strata beneath is either in large open conduits within competent limestone or as diffuse flow within the rock fracture network. The nearest surface water feature is Termon lough, >1km to the south.

The EPA conducts an ongoing monitoring programme of water quality in the Western RBD and surrounds. A number of monitoring locations have been identified in the region. The 2 No. nearest monitoring stations are located in the Coole and Kinvarra catchment (Galway Bay south east). Water quality on the at both locations is considered good (unpolluted).

Groundwater samples were taken from the flooded area of the Substitute Consent area in 2014 and 2020. Results from the analysis of the samples are consistent with natural uncontaminated groundwaters, showing no signs of mineral or nutrient contamination. Baseline results from both locations were below the Groundwater Regulations (S.I. 9 of 2010). Nitrate (<10 mg/l as NO<sub>3</sub>) concentrations were below their respective threshold values. All hydrocarbons were below detection limits. Suspended solids in the flooded quarry area were low (<10 mg/l).

### 5.3 CHARACTERISATION OF EUROPEAN SITES POTENTIALLY AFFECTED

Full site synopses for the European sites under consideration is provided in Appendix C. Detailed conservation objectives are in the process of being developed by NPWS for each European Site in Ireland but are presently not available for the sites listed. The generic conservation objectives for each site listed below are presented in Table 2, with reference to the qualifying interests of these designations.

#### 5.3.1 *East Burren Complex SAC*

This site boundary lies ca. 0.65km to the west of the Ballysheedy Quarry site and forms a mosaic of habitats including limestone pavement, calcareous wetlands, dry calcareous grassland and heath. The nearest section of the site comprises a mosaic of turloughs/wetlands, scrub and dry grasslands.

Scrub cover is relatively good in this area of the Burren, with large expanses of Hazel (*Corylus avellana*) intermixed with Spindle (*Euonymus europaeus*), Guelder-rose (*Viburnum opulus*) and Blackthorn (*Prunus spinosa*). An interesting scrub community of Alder Buckthorn (*Frangula alnus*), a Red Data Book species, Buckthorn (*Rhamnus catharticus*) and Shrubby Cinquefoil (*Potentilla fruticosa*), also a Red Data Book species, fringes the shores of some of the lakes and turloughs to the east. Ballyeighter Wood to the east (of the SAC) is an unusual scrub community on limestone, with regenerating oak (*Quercus* sp.) amongst Hazel, Ash (*Fraxinus excelsior*), Holly (*Ilex aquifolium*) and Hawthorn (*Crataegus monogyna*). This is an example of a woodland type that is rare in the Burren region. The eastern edge of Slieve Carran is dominated by steep cliffs and scree slopes over which Ash and Hazel wood is developed. This represents one of the few remaining woodland habitats in the Burren.

Caves are a feature of this site, with four known natural limestone caves showing a variety of formations and passage types. Vigo Cave has one of the best undisturbed cave entrance facies in Ireland and is considered a valuable karst heritage landform. Glencurrane Cave shows some fine phreatic solution features and one passageway, known as “Crinoid Tower”, shows an abundance of crinoids which have been out by splashing water. Gortlecka Cave and a series of small caves above Lough Inchiquin are other fine examples of this habitat.

The East Burren site supports an internationally important population of Lesser Horseshoe Bat, with an estimated 400 individuals. There are two known nursery roosts, a transition roost and four known winter sites, the latter all in natural limestone caves. The nearest roost as detailed on Map 10 of the conservation objectives is 5.5km south west (roost ID 216).

### 5.3.1.1 Qualifying Interests

The current overall conservation status (trend in brackets) of this sites qualifying interests are as follows:

- Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140]
- Turloughs [3180]
- Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation [3260]
- Alpine and Boreal heaths [4060]
- Juniperus communis formations on heaths or calcareous grasslands [5130]
- Calaminarian grasslands of the Violetalia calaminariae [6130]
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (\* important orchid sites) [6210]
- Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510]
- Calcareous fens with Cladium mariscus and species of the Caricion davalliana [7210]
- Petrifying springs with tufa formation (Cratoneurion) [7220]
- Alkaline fens [7230]
- Limestone pavements [8240]
- Caves not open to the public [8310]
- Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0]
- Euphydryas aurinia (Marsh Fritillary) [1065]
- Rhinolophus hipposideros (Lesser Horseshoe Bat) [1303]
- Lutra lutra (Otter) [1355]

A site-specific conservation objectives document is available for this SAC since 2022. In conjunction with considering the conservation objective to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected, a set of site specific conservation objectives has been compiled for the qualifying interests of the SAC and used to inform this assessment, based on site specific conservation objectives documents available for other European sites with equivalent qualifying interest habitats or species. This sets out the attributes, measures and targets that would be expected to define the favourable conservation condition of QI habitats and species within the SAC.

### 5.3.2 Coole Garryland Turlough SAC

The Coole-Garryland Complex is situated in a low-lying karstic limestone area west of Gort, in Co. Galway. It contains a series of seasonal lakes (turloughs), which are fed by springs and a partly submerged river, surrounded by woodland, pasture and limestone heath. The more well-known turloughs present in the site include Lydacan, Crannagh North, Raheen, Crannagh South, Coole, Garryland, Newtown and Hawkhill.

The turloughs are fringed by a range of habitats, including the nationally rare scrub communities containing Buckthorn (*Rhamnus catharticus*), Hawthorn (*Crataegus monogyna*) with occasional Alder (*Alnus glutinosa*) and Pedunculate Oak (*Quercus robur*) and with a herb layer dominated by meadowsweet (*Filipendula ulmaria*). This woodland falls into the alder-meadowsweet (*Alnus glutinosa*-*Filipendula ulmaria*) type, hawthorn-herb-Robert (*Crataegus monogyna*- *Geranium robertianum*) subtype.

#### 5.3.2.1 Qualifying Interests

The current overall conservation status (trend in brackets) of this sites qualifying interests are as follows:

[3150] Natural Eutrophic Lakes

[3180] Turloughs\*

[3270] *Chenopodium rubri* p.p. and *Bidention* p.p. Vegetation

[5130] Juniper Scrub

[6210] Orchid-rich Calcareous Grassland\*

[8240] Limestone Pavement\*

[91J0] Yew Woodlands\*

A site-specific conservation objectives document is available for this SAC. In conjunction with considering the generic conservation objective to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected, a set of site specific conservation objectives has been compiled for the qualifying interests of the SAC and used to inform this assessment, based on site specific conservation objectives documents available for other European sites with equivalent qualifying interest habitats or species. This sets out the attributes, measures and targets that would be expected to define the favourable conservation condition of QI habitats and species within the SAC.

### 5.3.3 Caherglassaun SAC

Caherglassaun is a large lake located 6 km north-west of Gort and 5 km south-east of Kinvarra in the low-lying farmland of east Co. Galway. Situated in a natural depression just to the north-west of Coole Nature Reserve, this site comprises a permanent lake at its core, while the rest of the basin functions as a turlough. At times of high water, the site can flood to a depth of 10-15 m. A series of collapse features act as swallow-holes.

Caherglassaun is an interesting site and shows some features which are not typical of turloughs. Firstly, it has a permanent lake at its base which is relatively deep and has an aquatic flora of

Pondweeds (*Potamogeton* spp.) and Rigid Hornwort (*Ceratophyllum demersum*). Secondly, because of its proximity to sea-level, the lake fluctuates 30 cm or so in a tidal cycle, but it is delayed significantly behind tidal height at Kinvarra. Water levels in the summer are approximately 3mOD. Groundwater from Coole Garryland discharges to Caherglassaun.

The turloughs are fringed by a range of habitats, including the nationally rare scrub communities containing Buckthorn (*Rhamnus catharticus*), Hawthorn (*Crataegus monogyna*) with occasional Alder (*Alnus glutinosa*) and Pedunculate Oak (*Quercus robur*) and with a herb layer dominated by meadowsweet (*Filipendula ulmaria*). This woodland falls into the alder-meadowsweet (*Alnus glutinosa*-*Filipendula ulmaria*) type, hawthorn-herb-Robert (*Crataegus monogyna*- *Geranium robertianum*) subtype.

### 5.3.3.1 Qualifying Interests

The current overall conservation status (trend in brackets) of this sites qualifying interests are as follows:

- Turloughs [3180]
- Rivers with muddy banks with *Chenopodium rubri* p.p. and *Bidention* p.p. vegetation [3270]
- *Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303]

### 5.3.4 Detailed Conservation Objectives

Detailed conservation objectives have been developed for the site under consideration and is included in Appendix A.

## 5.4 IDENTIFICATION OF POTENTIAL SIGNIFICANT ADVERSE EFFECTS

In the absence of mitigation measures to control and manage potentially polluting emissions, and given the vulnerability of groundwater in karstic environments, there is a possibility of groundwater pollutants reaching groundwater dependant habitats. This impact has the potential for adverse effects such as loss of sensitive species resulting in a shift in species composition, and subsequent loss or fragmentation of the extent of qualifying Annex I habitat. Water from hardstanding areas were directed to an oil interceptor, a settlement lagoon and a percolation area. The water required for the wheelwash were recycled via an oil interceptor. All stormwater/ surface water run-off were directed to the oil interceptor, settlement lagoon and percolation area located within the Substitute Consent Quarry site. Any other surface water, falling on the site, not recycled within the site will continue to dissipate to ground. Mitigation measures were implemented to control and manage potentially polluting emissions within the site as detailed in Section 5 below.

The quarry had the potential to create dust through material and machinery movement which may be transported offsite on the wheels of trucks or by wind. As detailed in Section 4, the area is outside of the potential ZOI. No further extraction from the substitute consent area at Ballysheedy Quarry site is proposed. There is no potential for the development to generate significant quantities of dust at the nearest Natura Site. It is noted in the DoEHLG (2004) Quarry guidelines that the most severe dust conditions are likely to be experienced within about 100m of the dust source. No evidence of dust impacts was noted in the area surrounding the quarry.

Disturbance impacts to Annex II species are limited to the potential for lighting effects on foraging bats in the local context. This is not considered the localised extraction, distance to relevant SACs and the absence of potential Lesser horseshoe bat roost sites would result in significant potential impacts on Natura sites.

#### 5.4.1 East Burren Complex SAC

The East Burren Complex is ca. 0.65 km from the Ballysheedy Quarry site boundary. There is no additional proposed excavation within the site and no works are required below the current lowest floor level. Therefore, there is no drawdown of groundwater levels. There is no requirement therefore for pumping of groundwater. Water quality at the quarry is good.

Groundwater flow has been identified as chiefly to the northeast of the site, away from the turlough habitat for which this site is designated. Any potential pollutants entering groundwater would not have the potential to affect the qualifying turlough habitat. Mitigation measures are detailed in Section 5 below to ensure that potential pollutants do not reach groundwater. When these mitigation measures are fully implemented, no adverse effects to the Annex I habitats of this site are anticipated.

The SAC is located ca. 0.65 km from the site boundary, and outside the <300m range where dust impacts are most likely to occur. Given the activity, the potential for dust generation is considered negligible and not located 'downwind' of prevailing south-westerly winds. No significant adverse effects to the Annex I habitats for which the site is designated are anticipated.

#### 5.4.2 Coole Garryland Complex SAC

The groundwater dependant wetland habitats are ca. 1.3 km from the Ballysheedy Quarry site boundary (turlough and fen). No karst conduits were encountered on the application site.

Groundwater/surface water flow into Lough Coole at Kiltartan, north of Gort (EPA River Flow estimation 29\_677) is calculated at 0.852 m<sup>3</sup>/second at low flow (95%ile). Given the average throughflow at the quarry is 0.002 m<sup>3</sup>/second, and the good water quality at the quarry, the potential for impact is negligible.

#### 5.4.3 Caherglassaun Turlough SAC

The turlough habitat is ca. 5 km from the Ballysheedy Quarry site boundary. Groundwater flow has been identified as chiefly to the northwest of the site, and towards the Coole Garryland complex and Caherglassaun Turlough SAC. Due to the lack of significant karst and limited groundwater percolation would not mitigate against the potential for significant impacts. The implementation of previous mitigation measures in full will ensure that no adverse effects to the Annex I habitats of this site will occur.

The Lesser horseshoe bat roost (roost id. 246 in NPWS database) is located approximately 6 km due northwest of the development site. Lesser horseshoe bats, *Rhinolophus hipposideros*, forage in woodland, hedgerow and tree line habitats within 2-3 km of their maternity roosts (Schofield 1996<sup>29</sup>). Woodlands, predominately broadleaf, are the predominant foraging habitat utilised by the species. In addition, these bats forage in areas of high habitat diversity. Conservation management

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<sup>29</sup> Schofield, H.W., 1996. The ecology and conservation biology of *Rhinolophus hipposideros*, the lesser horseshoe bat (Doctoral dissertation, University of Aberdeen).

of this species should concentrate on such areas within 2.5 km of the nursery roost (Bontadina *et al.* 2001<sup>30</sup>). This species flies close to vegetation, and feeds by aerial hawking, gleaning and by pouncing on prey close to the ground. Their foraging and predator avoidance strategies give them strong associations with woodlands and linear tree-lines for commuting (McAney & Fairley 1988<sup>31</sup>). On the basis of distance, as above, and taking account of the absence of continuous foraging corridors, with reference to the limited foraging habitat for this species within the Ballysheedy Quarry site or adjacent lands, it is concluded that there is no potential for significant adverse effects on Lesser horseshoe bats, in view of their conservation objectives. Mitigation measures related to site lighting are prescribed to avoid adverse effects to this Annex II species. The development is not identified on Map 3 of the conservation objectives.

Groundwater/surface water flow into Lough Coole at Kiltartan, north of Gort (EPA River Flow estimation 29\_677) is calculated at 0.852 m<sup>3</sup>/second at low flow (95%ile). Significant additional flow occurs at Caherglassaun turlough located downgradient of Lough Coole. Given the average throughflow at the quarry is 0.002 m<sup>3</sup>/second and the good water quality at the quarry, the potential for impact is negligible.

## 5.5 POTENTIAL IN-COMBINATION EFFECTS

Potential in-combination effects with the M17/M18 Gort to Tuam Motorway scheme are considered. This large infrastructure development passes between Cultra Lough and Coole Lough complex to the northwest, and East Burren Complex to the southeast. This development will have a range of potential impacts to these sites during the construction and operational stages.

Mitigation measures were applied for the development, and no impacts or pathways for effects which would have the potential to interact with the qualifying interests of any designated Natura 2000 site. No significant residual effects to key ecological receptors are predicted for this development 'alone' in the long-term, and minor residual impacts were confined to a local (site) level. As there were no dewatering or impacts to groundwater levels from the development at the Ballysheedy Quarry site, there is no potential for cumulative impacts to these protected habitats in this regard.

Similarly, there are no potential impacts identified which would significantly affect Lesser horseshoe bats, with respect to potential foraging or temporary roosts occurring outside of the development site. The M18 Motorway development comprises a gap in the commuting corridor for this species in the vicinity of the development; however, there is no synergistic or in-combination impact which could be attributed to the development at the Ballysheedy Quarry site. Mitigation measures were implemented where required to the north of Coole Lough.

Cumulative impacts with former quarrying work at the Ballysheedy Quarry site are not considered significant. High value habitats that were removed in the past as part of the former quarry works, occur in the wider environs of the site. The remediation plan has been designed to address the planning condition requirements with respect to the former quarry and will facilitate the establishment of high value habitats, reflecting those occurring in the surrounding area. No

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<sup>30</sup> Bontadina, F., Schofield, H. and Naef-Daenzer, B., 2002. Radio-tracking reveals that lesser horseshoe bats (*Rhinolophus hipposideros*) forage in woodland. *Journal of Zoology*, 258(03), pp.281-290.

<sup>31</sup> McAney, C.M. and Fairley, J.S., 1988. Habitat preference and overnight and seasonal variation in the foraging activity of lesser horseshoe bats. *Acta Theriologica*, 33(28), pp.393-402.



dewatering or pumping occurred at the quarry site previously, neither is any proposed as part of the propped development at the Ballysheedy Quarry site. The development does not have the potential to interact or adversely affect protected ground-water dependant habitats associated with Natura 2000 sites within the study area.

## 6 MITIGATION MEASURES

### 6.1 WATER MANAGEMENT

The operator ensured that there is no impact on the local or regional surface water or groundwater environment as a result of the development proposed. To this end, several mitigation measures were implemented at the site:

- Refuelling and maintenance of vehicles were undertaken at designated locations to ensure the risk to the water is minimised;
- Spill kits were retained on site to ensure that all spillages or leakages are dealt with immediately and staff are trained in their proper use;
- No potentially polluting materials were stored within the remaining Substitute Consent area/Regeneration area;

There was no alteration to the regional karstic water table (due to the lack of karst in the site and limited permeability) required as a result of the works or arising from the dormant quarry. Therefore, there were no anticipated significant adverse effect on groundwater levels, either inside or outside the property boundary of the Substitute Consent site.

### 6.2 AIR QUALITY MANAGEMENT

#### 6.2.1 *Fugitive Dust*

Potential dust generated at the site is outside of the potential zone of influence for the nearest SAC. During construction & operation works) were kept to a minimum and will take all reasonable steps, as far as practical, to minimise dust emissions from the site.

### 6.3 NOISE

Noise mitigation measures for the control of noise were employed at the Ballysheedy Quarry site within the Substitute Consent area/Regeneration area and during the construction & operation of the Quarry Extension, in order to ensure the relevant noise limits applicable to the site are not exceeded.

Whilst operational calculations have indicated that noise levels at the nearest noise sensitive locations were within the daytime noise limits applicable for the site, the site operator ensured the site is operated in the best practice manner in order to ensure that activities on site were controlled. There is no requirement, neither is there any proposal for blasting, breaking or crushing of rock within the Regeneration area or within the Substitute Consent site.

### 6.4 LIGHTING

Overnight lighting was kept to a minimum to avoid disturbance to foraging or commuting bat species. Security lighting and operational lighting during winter months use low-pressure sodium lights instead of high-pressure sodium lights or mercury lamps. Lighting was directional and avoid light spillage onto boundary habitats.



## 7 CONCLUSIONS OF STAGE 2 APPROPRIATE ASSESSMENT

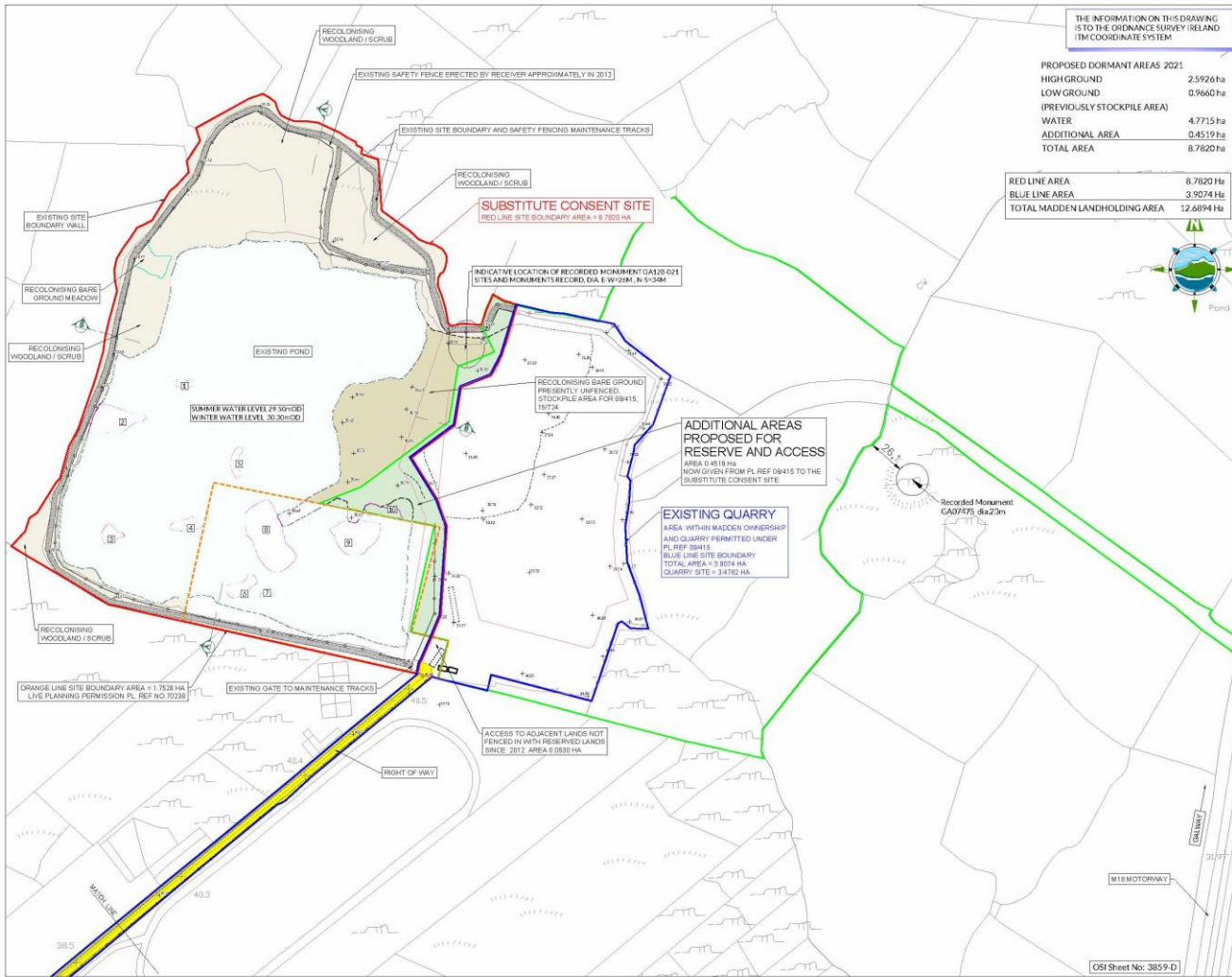
The substitute consent area has been evaluated with regard to the designated Natura 2000 sites within the wider study area. Potential impacts affecting the Qualifying Interests of the East Burren Complex SAC, Caherglassaun Turlough SAC, and Coole Garryland Complex SAC have been evaluated, with specific reference to water quality impacts, dust, noise and lighting affecting turlough habitats and the Annex II Lesser horseshoe bats. With the successful implementation of mitigation and monitoring measures described above, the development, either alone or in combination with other plans or projects will not result in significant adverse effects to the integrity of any European Sites, in view of their conservation objectives.

Potential impacts were avoided through design stage avoidance and via operational stage water quality management and a programme of ongoing monitoring. The mitigation measures set out in the current assessment, in addition to commitments from the Application Documents were implemented. The parameters for compliance in terms of water quality management as stipulated were achieved through ongoing monitoring during the works phase of the development. Operational stage water quality management followed effective measures in place for the avoidance of impacts on the qualifying interests of the ground-water dependant designated sites within the zone of influence; i.e., the integrity of these designations.

The proponent incorporated these measures into the project; with implementation on site ensured that there were no significant effects, either individually or in combination with other plans or projects affecting the conservation interests or conservation objectives of the East Burren Complex SAC, Caherglassaun Turlough SAC, and Coole Garryland Complex SAC i.e., the integrity of these Natura 2000 sites. It is therefore concluded that the development did not, beyond reasonable scientific doubt, adversely affect the integrity of any European Site (Natura 2000 site); whether directly, indirectly or cumulatively.

# APPENDIX A

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THE INFORMATION ON THIS DRAWING IS TO THE ORDNANCE SURVEY IRELAND (TM COORDINATE SYSTEM)

PROPOSED DORMANT AREAS 2021  
 HIGH GROUND 2,592.6 ha  
 LOW GROUND 0,960 ha  
 (PREVIOUSLY STOCKPILE AREA)  
 WATER 4,771.5 ha  
 ADDITIONAL AREA 0,451.9 ha  
 TOTAL AREA 8,782.0 ha

RED LINE AREA 8,782.0 Ha  
 BLUE LINE AREA 3,907.4 Ha  
 TOTAL MADDEN LANDHOLDING AREA 12,689.4 Ha

- LEGEND**
- Site Boundary
  - Land in Control of Applicant
  - Site Boundary Planning 2009
  - Quarry areas permitted under PL Ref. No. 09/413 (EOD 15/7/24)
  - Site Boundary Pl. Ref. No. 7023B (Dated 1994)
  - Existing Security Fence and Gate
  - Existing Maintenance Track
  - Existing Cliff and Pond Edge
  - Existing Level
  - Existing Pond
  - Existing Pond Features and Numbers
  - Additional Reserve Area & for Access



NOTES:  
 1. ALL INFORMATION ON THIS DRAWING IS TO BE TAKEN FROM THE ORDNANCE SURVEY IRELAND (TM COORDINATE SYSTEM).  
 2. ALL DRAWINGS TO BE INTERPRETED BY THE CONTRACTOR.  
 3. DIMENSIONS SHOWN ON THIS DRAWING ARE IN METERS UNLESS OTHERWISE SPECIFIED.  
 4. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND LOCATIONS OF ALL SERVICES UTILITIES ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES.  
 5. ALL LEVELS THROUGHOUT THIS DRAWING ARE TO ORDNANCE SURVEY DATUM AT 1924 MSL.

Rev	Desc	By	Chkd
1	Issue for Approval	JK	BR
2	Issue for Approval	JK	BR
3	Issue for Approval	JK	BR

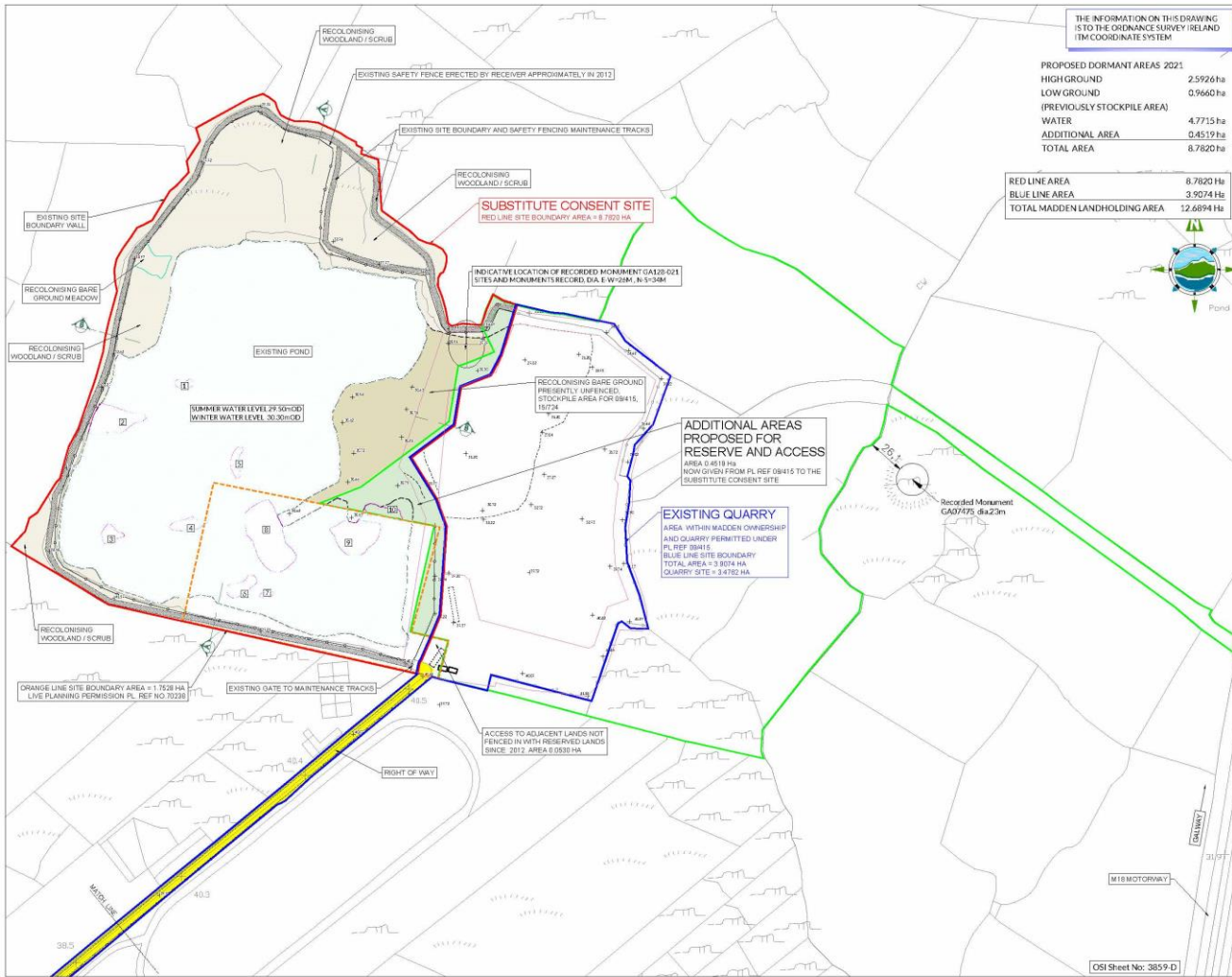
Client: John Madden & Sons Ltd.

Project: Application for substitute consent for previous development at this site within the townland of Ballysheehy, Gort, Co. Galway, June 2022

Title: Site Layout with additional Reserve Area

Scale: A1: 1:1250 @A3: 1:2500  
 Prepared by: JK Checked: BR Date: June 2022  
 Project Director: Brian Carroll  
 Drawing Title: Planning

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 Drawing No: 10925-3003 B



**LEGEND**

- Site Boundary
- Land in Control of Applicant
- Site Boundary Planning 2009
- Quarry area permitted under PL Ref. No. 09/415 (EOD 15/7/24)
- Site Boundary Pl. Ref. No. 7023B (Dated 1994)
- Existing Security Fence and Gate
- Existing Maintenance Track
- Existing Cliff and Fossil E-logs
- Existing Level
- Existing Pond
- Existing Pond Features and Numbers
- Additional Reserve Area & for Access



NOTES:

1. ALL INFORMATION ON THIS DRAWING IS TO BE TAKEN FROM THE ORDNANCE SURVEY IRELAND (TM COORDINATE SYSTEM).
2. ALL DRAWINGS TO BE INTERPRETED BY THE CONTRACTOR AND NOT BY THE ENGINEER.
3. ENGINEER'S RESPONSIBILITY IS LIMITED TO THE INFORMATION PROVIDED TO THE ENGINEER BY THE CLIENT AND TO THE INFORMATION PROVIDED BY THE CONTRACTOR.
4. THE CONTRACTOR SHALL VERIFY THE ACCURACY OF THE INFORMATION PROVIDED TO THE ENGINEER AND SHALL BE RESPONSIBLE FOR THE ACTUAL LOCATION OF ALL SERVICES UTILITIES ABOVE AND BELOW GROUND, RESERVE AND FENCING CONDUITS.
5. ALL LEVELS THROUGHOUT THIS DRAWING ARE UNLESS OTHERWISE SPECIFIED IN METRE HEAD.

Rev	Desc	By	Chkd
1	Issue for Approval	JK	BR
2	Minor Revision	JK	BR
3	Final Issue	JK	BR

Client: John Madden & Sons Ltd.

Project: Application for substitute consent for previous development at this site within the townland of Ballysheehy, Gort, Co. Galway, June 2022

Title: Site Layout with additional Reserve Area

Scale: A1: 1:1250 @A3: 1:2500

Prepared by: JK Checked: BR Date: June 2022

Project Director: Brian Carroll

Drawing Title: Planning

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Drawing No: 10925-3003 B

Revision:

# APPENDIX B

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Photographs from the Ecological Field Surveys





Photo location Map

Appendix A -

Plate 1: View of water edge - recolonisation of water edge

**Photograph Location:** 1

**Photograph Date:** 2022

**Matter:** Course chipping with good water clarity at water edge.

**Condition:** Developing aquatic plant layer.



Plate 2: Water edge



**Photograph Location:** 2

**Photograph Date:** 2022

**Matter:** Course chipping with good water clarity at water edge.

**Condition:** Developing aquatic plant layer.

Plate 3: Northern access track



Plate 4: Stockpile



**Photograph Location:** 4

**Photograph Date:** 2020

**Matter:** Stockpile. Course chipping with limited revegetation.

**Condition:** Developing a plant layer. Occasional sage and other pioneer species

Appendix A - Plate 5: Stockpile

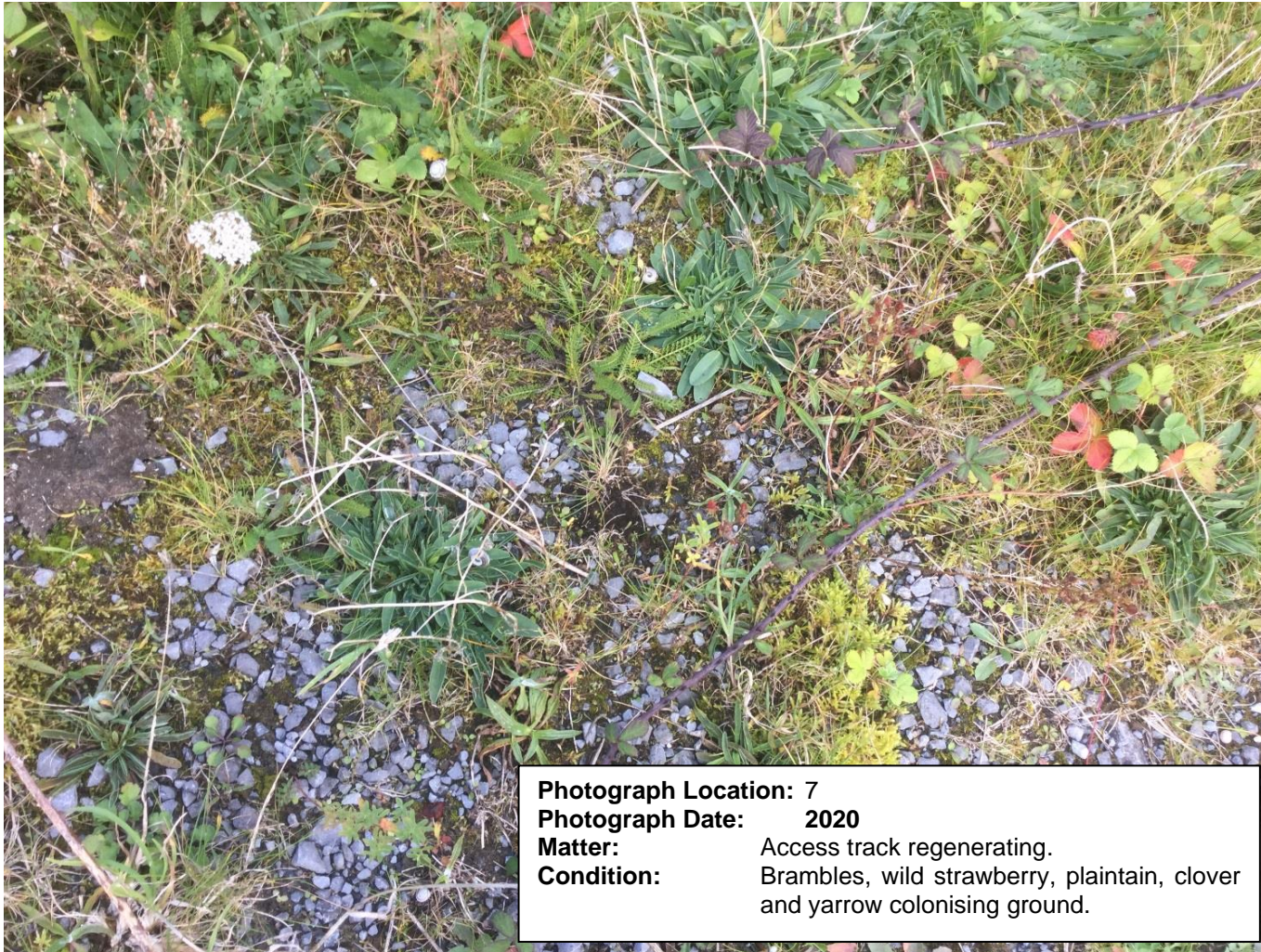


<b>Photograph Location:</b>	5
<b>Photograph Date:</b>	2020
<b>Matter:</b>	Stockpile of inert clean 5mm chips.
<b>Condition:</b>	No growth to date.

Plate 6: View into site



Appendix A - Plate 7:      Photograph Location 7. Revegetating bare ground



**Photograph Location:** 7  
**Photograph Date:** 2020  
**Matter:** Access track regenerating.  
**Condition:** Brambles, wild strawberry, plaintain, clover and yarrow colonising ground.





**Photograph Location:** 8  
**Photograph Date:** 2020  
**Matter:** Access track with quarry to the right  
**Condition:** Natural regeneration – scrub encroachment

Appendix A - Plate 9:      Photograph Location 9



**Photograph Location:** 9  
**Photograph Date:** 2020  
**Matter:** Waters edge with transition to clean inert stone and 20mm to 5mm stone.  
**Condition:** Limited growth at present.

Appendix A - Plate 10: Photograph Location 10 Northern scrub



Appendix A - Plate 11: Photograph Location 11

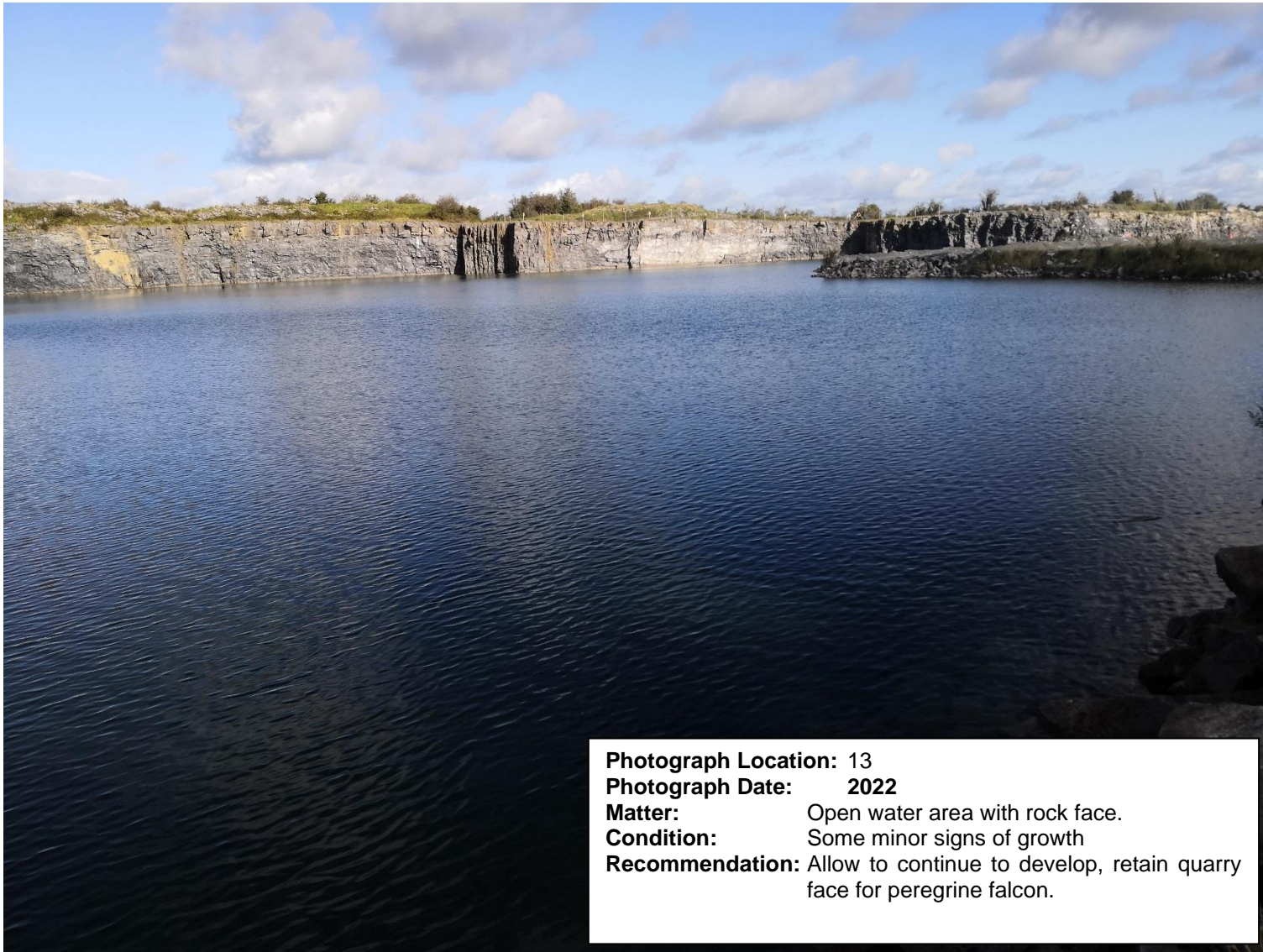


Appendix A -Plate 12: Photograph Location 12



**Photograph Location:** 12  
**Photograph Date:** 2020  
**Matter:** Grassy access track and hazel hedge – view east to surrounding grassland.  
**Condition:** Growth establishing with scrub

Appendix A - Plate 13: Photograph Location 13.



**Photograph Location:** 13  
**Photograph Date:** 2022  
**Matter:** Open water area with rock face.  
**Condition:** Some minor signs of growth  
**Recommendation:** Allow to continue to develop, retain quarry face for peregrine falcon.

Appendix A - Plate 14: Photograph Location 14



**Photograph Location:** 14  
**Photograph Date:** 2020  
**Matter:** Hedge on southern boundary  
**Condition:** Natural / indigenous growth developing.

# APPENDIX C

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## Site Synopsis

East Burren Complex SAC  
Caherglassaun Turlough SAC  
Coole Garryland Complex SAC





**Site Name: Caherglassaun Turlough SAC**

**Site Code: 000238**

Caherglassaun is a large lake located 6 km north-west of Gort and 5 km south-east of Kinvarra in the low-lying farmland of east Co. Galway. Situated in a natural depression just to the north-west of Coole Nature Reserve, this site comprises a permanent lake at its core, while the rest of the basin functions as a turlough. At times of high water, the site can flood to a depth of 10-15 m. A series of collapse features act as swallow-holes.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (\* = priority; numbers in brackets are Natura 2000 codes):

- [3180] Turloughs\*
- [3270] Chenopodion rubri p.p. and Bidention p.p. vegetation
- [1303] Lesser Horseshoe Bat (*Rhinolophus hipposideros*)

Caherglassaun is an interesting site and shows some features which are not typical of turloughs. Firstly, it has a permanent lake at its base which is relatively deep and has an aquatic flora of Pondweeds (*Potamogeton* spp.) and Rigid Hornwort (*Ceratophyllum demersum*). Secondly, because of its proximity to sea-level, the lake fluctuates 30 cm or so in a tidal cycle, but it is delayed significantly behind tidal height at Kinvarra. As a result of the fluctuation, an unusual plant community exists, dominated by Needle Spike-rush (*Eleocharis acicularis*) and Common Spike-rush (*E. palustris*). This resembles a saltmarsh in appearance although the water is not brackish. Other plant species which occur in the turlough at Caherglassaun include Creeping Yellow-cress (*Rorippa sylvestris*) and Water-purslane (*Lythrum portula*).

A mixed deciduous woodland occurs on rocky ground on the western side of the site. The canopy is dominated by Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*) and Buckthorn (*Rhamnus catharticus*). This is a young woodland which may develop further into an Ash (*Fraxinus excelsior*)-dominated stand in the absence of high grazing pressure.

Areas of exposed limestone occur within the site and include pavement, low cliffs and caves. This brings unusual plant species, such as Hairy Rock-cress (*Arabis hirsuta*), Biting Stonecrop (*Sedum acre*) and Polypody ferns (*Polypodium* spp.) into the edge of a turlough and adds diversity to the site. The rocky habitats also provide roosting sites for bats.

Three rare plant species, which are listed in the Irish Red Data Book, occur on the site. Mudwort (*Limosella aquatica*) occurs here - it tends to occur in sites which retain water into the summer months and in vegetation that corresponds to the E.U. Habitats Directive Annex I habitat type 'rivers with muddy banks with *Chenopodium rubri* p.p. and *Bidention* p.p. vegetation'. The south Galway area is the species' headquarters in Ireland. It is listed in the Flora (Protection) Order, 1999. Both Fen Violet (*Viola persicifolia*) and Northern Yellow-cress (*Rorippa islandica*) occur at Caherglassaun. These are characteristic turlough species which occur only to a very limited extent in other habitats.

A bat roost exists within the site. Lesser Horseshoe Bat and Natterer's Bat, which is listed in the Irish Red Data Book, roost here. Lesser Horseshoe Bat is listed on Annex II of the E.U. Habitats Directive, and Ireland has the largest national population in Europe. Loss of suitable summer habitat and disturbance during hibernation are the major threats to this species.

Caherglassaun shares in the populations of waterfowl that are based on Coole Lough. Whooper Swans, Wigeon and Lapwing are all regular visitors, though their numbers are low, while Lapwing may also nest here in some summers. Whooper Swan is listed on Annex I of the E.U. Birds Directive.

Any development which would involve drainage or alteration of the water table would threaten this site. Presence of grazers will also influence the site - low grazing levels would facilitate the further development of woodland at the site.

Caherglassaun is of considerable conservation value, and was rated as the sixth most important large turlough in a recent national survey, based on the vegetation found there. It has the most pronounced "tidal" fluctuation of any large site, and is remarkable for its complement of rare plants and animals.

**Site Name: Coole-Garryland Complex SAC**

**Site Code: 000252**

The Coole-Garryland Complex is situated in a low-lying karstic limestone area west of Gort, in Co. Galway. It contains a series of seasonal lakes (turloughs), which are fed by springs and a partly submerged river, surrounded by woodland, pasture and limestone heath. The more well-known turloughs present in the site include Lydacan, Crannagh North, Raheen, Crannagh South, Coole, Garryland, Newtown and Hawkhill.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (\* = priority; numbers in brackets are Natura 2000 codes):

[3150] Natural Eutrophic Lakes
[3180] Turloughs*
[3270] <i>Chenopodium rubri</i> p.p. and <i>Bidention</i> p.p. Vegetation
[5130] Juniper Scrub
[6210] Orchid-rich Calcareous Grassland*
[8240] Limestone Pavement*
[91J0] Yew Woodlands*

The turloughs at Coole-Garryland are particularly good examples of this habitat type. Their vegetation includes such species as Shoreweed (*Littorella uniflora*), Common Spike-rush (*Eleocharis palustris*), Water-purslane (*Lythrum portula*) and Fen Violet (*Viola persicifolia*). A species of Water-starwort, *Callitriche palustris*, was recently recorded from the site, its first known station in Ireland – it has since been noted in several other turlough sites. The Coole River itself is of particular interest for the occurrence of a rare riverine habitat characterised by Trifid Bur-marigold (*Bidens tripartita*), Red Goosefoot (*Chenopodium rubrum*) and species of Knotgrass (*Polygonum* spp.). In the habitat ‘natural eutrophic lake’ at the site, species such as Pondweeds (*Potamogeton perfoliatus* and *P. berchtoldii*), Water-starworts and Rigid Hornwort (*Ceratophyllum demersum*) are to be found.

The turloughs are fringed by a range of habitats, including the nationally rare scrub communities containing Buckthorn (*Rhamnus catharticus*), Hawthorn (*Crataegus monogyna*) with occasional Alder (*Alnus glutinosa*) and Pedunculate Oak (*Quercus robur*) and with a herb layer dominated by meadowsweet (*Filipendula ulmaria*). This woodland falls into the alder-meadowsweet (*Alnus glutinosa-Filipendula ulmaria*) type, hawthorn-herb-Robert (*Crataegus monogyna- Geranium robertianum*) subtype.

A remarkable feature of Coole-Garryland is that several of the turloughs are surrounded by woodland. The main body of the woodland is dominated by Ash (*Fraxinus excelsior*) mixed with Pedunculate oak, occasional Elm (*Ulmus glabra*), Wild Cherry (*Prunus avium*) and Crab Apple (*Malus sylvestris*). Exotic species are widespread, especially Beech (*Fagus sylvatica*) and Sycamore (*Acer pseudoplatanus*) but also with some Hornbeam (*Carpinus betulus*), Horse-chestnut (*Aesculus hippocastanum*) and conifers, including Scots Pine (*Pinus sylvestris*). Many of these species are freely regenerating. The understorey is heterogeneous and is mainly made up of Hazel (*Corylus avellana*), Hawthorn, Spindle (*Euonymus europaeus*), Privet (*Ligustrum vulgare*) (possibly introduced), Guelder Rose (*Viburnum opulus*), Blackthorn (*Prunus spinosa*), Honeysuckle (*Lonicera periclymenum*) and abundant Ash saplings. The field layer is typical of native woodlands on limestone and includes: Wood Anemone (*Anemone nemorosa*), Dog Violet (*Viola riviniana*), False Brome (*Brachypodium sylvaticum*), Tutsan (*Hypericum androsaemum*), Maidenhair Spleenwort (*Asplenium trichomanes*) and Bitter Vetch (*Lathyrus montanus*). The woodlands are notable for the presence of rare species of Myxomycete fungi, including *Licea idris*, *Licea marginata* and *Macbrideola decapillata*, the first-named in one of only three known sites for the species. Much of this woodland falls into the ash-ivy (*Fraxinus excelsior*-*Hedera helix*) type, hazel-wood-sorrel (*Corylus avellana*-*Oxalis acetosella*) sub-type.

To the east of Coole Lough, the woodland is highly modified with stands of conifers and Beech. This area is most subject to visitor pressure as it is adjacent to the visitor centre and car park.

Between Doo Lough and Coole Lough is an area of low Hazel woodland around limestone pavement and scrub. Ash is abundant here and Hawthorn, Spindle, Holly *Ilex aquifolium*) and Yew (*Taxus baccata*) also occur. The field layer is similar to that of the main woodland with the addition of such pavement species as Broad-leaved Helleborine (*Epipactis helleborine*), Wall Lettuce (*Mycelis muralis*) and the Southern Polypody fern (*Polypodium australe*).

Between Doo Lough and Garryland Turlough are several small stands of Yew-dominated woodland on limestone knolls. Pedunculate oak, Ash and Beech occur within these stands. Both the shrub layer and the herb layer are very poorly developed or almost absent but the bryophyte layer, dominated by *Thamnobryum alopecurum* with *Neckera crispa* is well developed. There is a small amount of Yew regeneration at this site and Yew is widely scattered through the surrounding woodland.

In places, heath communities have developed over the limestone pavement, consisting of Ling Heather (*Calluna vulgaris*), Juniper (*Juniperus communis*), Blue Moor-grass (*Sesleria albicans*) and occasional Yew. In addition, the site contains good examples of smooth pavement and associated species-rich grasslands. Small areas of orchid-rich grassland also occur with the following species recorded; Pyramidal Orchid (*Anacamptis pyramidalis*), Spotted Orchids (*Dactylorhiza* spp.), Fragrant Orchid (*Gymnadenia conopsea*), Fly Orchid (*Ophrys insectifera*) and Greater Butterfly Orchid (*Platanthera chlorantha*).

The nationally rare Mudwort (*Limosella aquatica*) and Dropwort (*Filipendula vulgaris*) also occur at the site. These two plant species are listed in the Irish Red Data Book, and Mudwort is included in the Flora (Protection) Order, 2015.

The complex of habitats at Coole-Garryland provides habitat for a variety of mammal species, including Otter and Pine Marten. Otter is listed in Annex II of the E.U. Habitats Directive. The Coole-Garryland complex is also home to one of the most important and unique assemblages of insects in the country, including several notable species of beetles and flies.

The area is of importance for wintering waterfowl, especially Whooper Swan (mean peak of 324 in 1995/96 - 98/99), Bewick's Swan (79 in winter 96/97), Wigeon (mean peak of 1044 in 1995/96 - 98/99), Mallard (mean peak of 330 in 1995/96 - 98/99), Pochard (mean peak of 176 in winter 1995/96 - 98/99), along with smaller numbers of Teal, Tufted Duck, Lapwing, Curlew and Dunlin. In 1996 seven pairs of Lapwing bred at Newtown Turlough and two pairs of Common Sandpiper bred at Coole Lough.

A substantial portion of this site is in the ownership of the National Parks and Wildlife Service and is designated as a nature reserve. Long-term management aims to gradually remove the non-native species. It is a popular amenity area with well-developed pathways. Uncontrolled visitor access may pose a threat to sensitive animals although the nature of the terrain is such that areas away from the paths are seldom visited. Other threats to the site may result from the intensification of agriculture (e.g. fertiliser application or pollution of watercourses) and/or drainage outside the SAC.

The turlough system at Coole-Garryland is considered to be the most diverse in the country, for both its physiography and vegetation; it is unique in that it is so closely associated with woodland. The woodland is extremely diverse in terms of both habitat and species and was assessed as having the highest conservation rating in the country among the sites surveyed for the National Survey of Native Woodlands. The juxtaposition of these two distinct habitats has led to the development of interesting plant and animal communities that include a suite of rare insect, plant and fungal species. The site includes good quality examples of seven habitats that are listed on Annex I of the E.U. Habitats Directive. Overall, the range of good quality habitats present at Coole-Garryland which support a high diversity of species render the site of high conservation value.

**Site Name: East Burren Complex SAC**

**Site Code: 001926**

This large site incorporates all of the high ground in the east Burren in Counties Clare and Galway, and extends south-eastwards to include a complex of calcareous wetlands. The area encompasses a range of limestone habitats that include limestone pavement and associated calcareous grasslands and heath, scrub and woodland together with a network of calcareous lakes and turloughs. The site exhibits some of the best and most extensive areas of oligotrophic limestone wetlands to be found in the Burren and in Europe.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (\* = priority; numbers in brackets are Natura 2000 codes):

- [3140] Hard Water Lakes
- [3180] Turloughs\*
- [3260] Floating River Vegetation
- [4060] Alpine and Subalpine Heaths
- [5130] Juniper Scrub
- [6130] Calaminarian Grassland
- [6210] Orchid-rich Calcareous Grassland\*
- [6510] Lowland Hay Meadows
- [7210] *Cladium* Fens\*
- [7220] Petrifying Springs\*
- [7230] Alkaline Fens
- [8240] Limestone Pavement\*
- [8310] Caves
- [91E0] Alluvial Forests\*
  
- [1065] Marsh Fritillary (*Euphydryas aurinia*)
- [1303] Lesser Horseshoe Bat (*Rhinolophus hipposideros*)
- [1355] Otter (*Lutra lutra*)

The limestone pavement at this site includes smooth blocky and shattered types. The bare pavement is interspersed with species-rich calcareous vegetation communities. Typical grassland species found on or near the pavement include Blue Moor-grass (*Sesleria albicans*), Mountain Everlasting (*Antennaria dioica*), Bloody Crane's-bill (*Geranium sanguineum*) and Wild Thyme (*Thymus praecox*). Where soil cover is more

extensive purer grassland communities are found, and these are often orchid-rich. Species such as Pyramidal Orchid (*Anacamptis pyramidalis*), Frog Orchid (*Coeloglossum viride*), Fragrant Orchid (*Gymnadenia conopsea*), Bee Orchid (*Ophrys apifera*), Fly Orchid (*Ophrys insectifera*), Butterfly Orchid (*Platathera chlorantha*) and Dense-flowered Orchid (*Neotinea maculata*) have all been recorded.

Limestone heath is well developed in parts of the uplands where Heather (*Calluna vulgaris*) and Bell Heather (*Erica cinerea*) are common, along with St. John's-wort species (*Hypericum* spp.) and Tormentil (*Potentilla erecta*). Two rare plant species found in this habitat are the Hoary Rock-rose (*Helianthemum canum*) and Pyramidal Bugle (*Ajuga pyramidalis*); both species are listed in the Red Data Book. To the south-east around the western shores of Lough Bunny an interesting alpine heath community occurs. Here Bearberry (*Arctostaphylos uva-ursi*) is found at one of its few inland, lowland locations in the Burren. Juniper scrub is sometimes found associated with areas of heath at this site, with Juniper (*Juniperus communis*) and Crowberry (*Empetrum nigrum*) both found here.

Ballyeighter Loughs complex to the east is a large network of calcareous hardwater lakes and turloughs with associated fen, cut-away bog and calcareous marsh habitats. The complex contains many species of plant and animal that are found in areas of fluctuating water levels. The alkaline fen flora is well developed and large areas of Great Fen-sedge (*Cladium mariscus*) and Black Bog-rush (*Schoenus nigricans*) occur, along with a diverse complement of associated species. Some of the best and most extensive calcareous swamp fen communities in the country occur within this complex and further north-east around the shores of Lough Bunny. Between this lake and the Coole-Garryland turlough complex to the north-east of the site, another area of oligotrophic limestone wetlands occurs. This type of ecosystem is now very rare in Europe and many of the habitats found are listed on Annex I of the E.U. Habitats Directive.

The site has an excellent array of turloughs, with at least eight known examples including those at Carran, Knockaunroe, Lough Mannagh, Castle Lough, Lough Aleenaun, Turloughmore, Tulla and Roo. These turloughs represent some of the best examples of this habitat type found in Ireland and display a wide diversity in trophic status, water fluctuations, water retention and vegetation types. The aquatic plant communities are well developed and the rare, Red Data Book species, Mudwort (*Limosella aquatica*), occurs here. This species is listed in the Flora (Protection) Order, 1999.

Most of the lakes in the southern part of this site are considered examples of hard water lakes, a type listed in Annex II of the E.U. Habitats Directive. These are classic marl lakes, often surrounded by limestone pavement and scrub. They range from extreme oligotrophic types, such as Lough Bunny, to more mesotrophic or even eutrophic systems. Stonewort (*Chara* spp.) beds are common in Lough Inchiquin (and at Lough Bunny), along with pondweeds (*Potamogeton* spp.). *Nitella tenuissima*, a rare species found in calcareous fens, has been recorded in the Ballyeighter Loughs. A

number of other interesting *Chara* species have been recorded from waterbodies in the area.

The River Fergus is the only major overground river within the site. Between Lough Inchiquin and Lough Atedaun the river is slow moving and meanders through an area with wet grassland. Here the water-crowfoot *Ranunculus peltatus-pencillatus* is found, along with the moss *Fontinalis antipyretica*.

The occurrence of petrifying springs at this site is of note. Good examples of this rare habitat type are found at the cliffs at Slieve Carran. Well developed bryophyte and lichen communities are found in association with the springs.

Another uncommon habitat type found at this site is lowland hay meadow. These grasslands typically have a low, open sward dominated by herbs and poor-yield grasses, and are mown rather than grazed. Some common species include Oxeye Daisy (*Leucanthemum vulgare*), Yellow-rattle (*Rhinanthus minor*), eyebrights (*Euphrasia* spp.) and Common Knapweed (*Centaurea nigra*). A well-developed metallophyte plant community, ascribable to the Annex I habitat type Calaminarian Grassland, is present over an area of about 180 m<sup>2</sup> at an old mine site in Shesodonnell (East), with indicator bryophytes *Cephaloziella stellulifera* and *Weissia controversa* var. *densifolia*.

Scrub cover is relatively good in this area of the Burren, with large expanses of Hazel (*Corylus avellana*) intermixed with Spindle (*Euonymus europaeus*), Guelder-rose (*Viburnum opulus*) and Blackthorn (*Prunus spinosa*). An interesting scrub community of Alder Buckthorn (*Frangula alnus*), a Red Data Book species, Buckthorn (*Rhamnus catharticus*) and Shrubby Cinquefoil (*Potentilla fruticosa*), also a Red Data Book species, fringes the shores of some of the lakes and turloughs to the east.

Ballyeighter Wood to the east is an unusual scrub community on limestone, with regenerating oak (*Quercus* sp.) amongst Hazel, Ash (*Fraxinus excelsior*), Holly (*Ilex aquifolium*) and Hawthorn (*Crataegus monogyna*). This is an example of a woodland type that is rare in the Burren region. The eastern edge of Slieve Carran is dominated by steep cliffs and scree slopes over which Ash and Hazel wood is developed. This represents one of the few remaining woodland habitats in the Burren.

A narrow band of alluvial woodland occurs along the karstic stream at the north-east corner of Lough Gortlecka. This is considered to be a unique variant of this uncommon woodland type. The wood is dominated by Hazel, Ash, Wych Elm (*Ulmus glabra*) and Rusty Willow (*Salix cinerea* subsp. *oleifolia*), with Ramsons (*Allium ursinum*) and a variety of other herbs occupying the flooded areas of the woodland floor.

Caves are a feature of this site, with four known natural limestone caves showing a variety of formations and passage types. Vigo Cave has one of the best undisturbed cave entrance facies in Ireland and is considered a valuable karst heritage landform. Glencurrane Cave shows some fine phreatic solution features and one passageway, known as "Crinoid Tower" shows an abundance of crinoids which have been etched



out by splashing water. Gortlecka Cave and a series of small caves above Lough Inchiquin are other fine examples of this habitat.

In the east Burren wetlands Mute Swan and Whooper Swan occur in internationally important concentrations, while Wigeon, Lapwing, Dunlin, Black-tailed Godwit and Goldeneye are also very numerous. Also found in wetlands on the site (e.g. Lough Atedaun, Carran Turlough, Lough Aleenaun, Lough Inchiquin, Lough Bunny, Lough Cullaun, Muckanagh Lough) are Bewick's Swan, Teal, Mallard, Gadwall, Shoveler, Tufted Duck, Curlew, Golden Plover, Coot and Little Grebe. The site also supports a flock of Greenland White-fronted Goose. Several of these species are listed in the Red Data Book and on Annex I of the E.U. Birds Directive.

A nesting pair of Peregrine Falcon, a species listed on Annex I of the E.U. Birds Directive, occur on Glasgeivnagh Hill. The east Burren wetlands are frequented by Sparrowhawk, Kestrel and Hen Harrier, a rare species which is also listed on Annex I of the E.U. Birds Directive. Pine Marten and Otter have been recorded regularly within the site - both are listed in the Red Data Book as they are considered threatened in Europe, the latter also on Annex II of the E.U. Habitats Directive.

The site supports an internationally important population of Lesser Horseshoe Bat, with an estimated 400 individuals. There are two known nursery roosts, a transition roost and four known winter sites, the latter all in natural limestone caves. Pipistrelle and Brown Long-eared Bats also occur. All of these species are listed in the Red Data Book, the former also on Annex II of the E.U. Habitats Directive. The Lesser Horseshoe Bat is a small, delicate bat which is confined to six western counties, Mayo, Galway, Clare, Limerick, Kerry and Cork. It forages close to woodland and at the edges of water. The Irish population of this species is estimated to be about 12,000 individuals and may be the largest national population in Europe. The Pipistrelle Bat is the smallest bat to occur in Ireland and is the commonest and most widespread species. Pipistrelle Bats forage where small insects gather, in gardens, along hedgerows and trees, over ponds and along rivers. The Brown Long-eared Bat is the second most common bat in Ireland and is easily identified by its long ears which are nearly as long as its body. The Brown Long-eared Bat forages in and along woodland where they glean insects off foliage.

The site includes a large population of Marsh Fritillary, a species of butterfly listed on Annex II of the E.U. Habitats Directive. The site also supports the only known populations of Slow Worm (*Anguis fragilis*) in Ireland - this lizard is believed to have been introduced in about 1970. Arctic Char (*Salvelinus alpinus*), a Red Data Book fish species, has been recorded from Lough Inchiquin.

Most of the site is grazed by cattle and sheep, and in some areas, particularly the uplands, by feral goats. Slieve Carran is a Statutory Nature Reserve, while some 750 square km within the region of Mullaghmore makes up the Burren National Park. Clearance and intensification of agriculture has caused damage to some parts of the site. This threatens the heath and scrub communities and may cause eutrophication (nutrient enrichment) of the lakelands to the east. Drainage and land reclamation

have occurred in places around the edges of wetlands, while some marginal fen areas have been afforested. Areas of agriculturally-improved land have been included within the site in order to protect the hydrology and nutrient status of the wetland system.

The East Burren Complex is of international scientific interest owing to the presence of fine examples of typical Burren habitats, together with an oligotrophic wetland complex of lakes, turloughs, fen, cut-over bog and calcareous marsh. The Ballyeigher complex represents an excellent example of a nutrient-poor calcareous lake and fen system, of European significance. Some of the only remaining woodland habitats to be found in the Burren occur within the site. The site contains fourteen habitats that are listed on Annex I of the E.U. Habitats Directive (six of which have priority status) and three species of animal listed on Annex II of this Directive and, as such, is of major conservation significance. The occurrence of many rare plants and animals within the site adds considerably to its scientific and conservation value. The site is of high ornithological interest too, for the internationally and nationally important numbers of waterfowl that use it.