JOHN MADDEN & SONS LTD
Specialists in Tarmacadam & Synthetic Tracks

Tonroe Quarry,
Ardrahan, Co. Galway

Development of an Asphalt Plant & Associated Works, in Former Quarry Processing/Dispatch Yard Area and Completion of Restoration of Previously Quarried Area

Natura Impact Statement

Sept 2017

TOBIN CONSULTING ENGINEERS

TOBIN
Consulting Engineers

NATURA IMPACT STATEMENT

PROJECT:

Tonroe Quarry
Ardrahan, Co. Galway
Development of an Asphalt Plant & Associated Works, in Former Quarry Processing/Dispatch Yard Area
and
Completion of Restoration of Previously Quarried Area

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Client: John Madden & Sons Ltd.

Project: Tonroe Quarry, Ardrahan, Co. Galway
Development of an Asphalt Plant & Associated Works, in Former Quarry Processing/Dispatch Yard Area
and
Completion of Restoration of Previously Quarried Area

Title: Natura Impact Statement

PROJECT NUMBER: 7625				DOCUMENT REF: 7625-04-01			
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Revision	**Description & Rationale**	**Originated**	**Date**	**Reviewed**	**Date**	**Authorised**	**Date**
TOBIN Consulting Engineers							

Tonroe Quarry, Ardrahan, County Galway

**Development of an Asphalt Plant & Associated Works,
in Former Quarry Processing/Dispatch Yard Area
and
Completion of Restoration of Previously Quarried Area**

Natura Impact Statement

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1 INTRODUCTION

This Natura Impact Assessment (hereafter referred to as 'NIS') has been prepared to accompany a Planning Application to Galway County Council for the Development of an Asphalt Plant & Associated Works in the Former Quarry Processing/Dispatch Yard Area (2.86 ha) of the now closed Tonroe Quarry.

The Planning Application includes a proposal to erect a Material Storage & Maintenance Building, reuse the existing weighbridge and wheelwash, renovate of the existing staff office and the Completion of Restoration of the Previously Quarried Area (19.26 ha).

Tonroe Quarry is located in a primarily agricultural area within the townland of Tonroe, approximately 1.5 km north of the settlement of Ardrahan, County Galway, a small village located on the N18 (National Galway-Ennis Road) between Oranmore and Gort. The site is located on lands to the immediate north of the N18 and is accessed via a local/private road (L-85664).

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.

An Appropriate Assessment is a requirement of Article 6 of the Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora (as amended) (hereafter referred to as the "Habitats Directive"). The overall aim of the Habitats Directive is to maintain or restore the "Favourable Conservation Status" of habitats and species of European Community Interest. These habitats and species are listed in the Habitats and Birds Directives (Council Directive 2009/147/EC on the conservation of wild birds), with Special Areas of Conservation and Special Protection Areas designated to afford protection to the most vulnerable of them. These two designations are collectively known as 'European Sites'.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations (in particular Part XAB of the Planning and Development (Amendment) Act 2010 and the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. 477) (often referred to as the Habitats Regulations) to ensure the ecological integrity of these sites.

Appropriate Assessment (AA) is an assessment of whether a plan or project, alone and in combination with other plans or projects, could have significant effects on a European Site in view of the site's conservation objectives. This NIS provides a detailed consideration of European Sites and their conservation objectives, which are the primary consideration for AA.

This report determines if direct, indirect and in-combination effects may arise as a result of the proposed development and restoration works, or if there were uncertainty regarding potential effects.

Given the "Precautionary Principle" requirements of Appropriate Assessment, mitigation measures are detailed to reduce/remove potential impacts; or possible uncertainty regarding potential impacts.

Stage 1 Screening for Appropriate Assessment implemented for the project determined that the development required Stage 2 of the Appropriate Assessment process to be undertaken. This report therefore takes the forms of a Natura Impact Statement (NIS), as required by the Birds and Natural Habitats Regulations (2011). The NIS has been prepared by an experienced and appropriately qualified TOBIN ecologist. An experienced TOBIN hydrogeologist, with a scientific background in determining potential water quality risk sources provided additional input to potential impacts affecting hydrology, hydrogeology and aquatic-dependant ecological receptors. This report was produced with specific reference to the existing environmental and ecological data available for the site.

1.1 LEGISLATIVE CONTEXT

The Appropriate Assessment process (AA) is an assessment of the potential for adverse or negative effects of a plan or project, in combination with other plans or projects, on the conservation objectives of a European Site. European Sites consist of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) and provide for the protection and long-term survival of Europe's most valuable and threatened species and habitats.

Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora - 'The Habitats Directive', has been transposed into Irish law by The European Community (Natural Habitats) Regulations 2011 (S.I. No. 477). The Birds Directive, Directive 2009/147/EC of the European Parliament and of the Council, seeks to protect birds of special importance by the designation of Special Protection Areas (SPAs), whereas the Habitats Directive does the same for habitats and other species groups with Special Areas of Conservation (SACs). The requirement of AA is outlined in Article 6(3) and 6(4) of the *EU Habitats Directive*. Article 6(3) of the Habitats Directive requires that:

> *"Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the 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."*

Furthermore, Article 6(4) of the Habitats Directive requires that:

> *"If, in spite of a negative assessment of the implications for the 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, the Member State 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."*

If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project may nevertheless be carried out for "Imperative Reasons Of Overriding Public Interest", including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 network is protected. It shall inform the Commission of the compensatory measures adopted. Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest.

Appropriate Assessment should be based on best scientific knowledge and Planning Authorities should ensure that scientific data (ecological, hydrological & hydrogeological expertise) is utilised. This report details a Natura Impact Statement to inform the AA process which is finalised by the Statutory Authority.

1.2 SOURCE-PATHWAY-RECEPTOR MODEL

Ecological Impact Assessment of potential indirect impacts on European Sites is conducted utilising a standard 'Source-Pathway-Receptor' model, where, in order for an indirect impact to be established all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism is sufficient to conclude that a potential effect is not of any relevance or significance. This report determines if direct, indirect and cumulative adverse effects will arise from the proposed development with respect to both components of the proposal, i.e.: Development of an Asphalt Plant & Associated Works in Former Quarry Processing/Dispatch Yard Area (2.86 ha); and the Completion of Restoration of the Previously Quarried Area (19.26 ha), the details of which are shown on Figure 2.

- Source(s) – e.g. pollutant run-off from proposed works via surface-water / storm water runoff, commercial and domestic effluents, dust and fine material releases.
- Pathway(s) – e.g. groundwater connecting to nearby qualifying wetland habitats, proximity to designated European Sites.
- Receptor(s) – Qualifying habitats and species of European sites.

Measures are proposed within this report to address impacts to both sources and pathways in order to address the potential for significant adverse effects. These measures are principally provided for at design stage and include the following:

- Provision of stormwater/surface water treatment within the Proposed Asphalt Plant Subsite, away from the Former Quarry Subsite/Proposed Restoration Area. Any surface water runoff from this area will be collected and directed to an oil interceptor, a grit settlement lagoon and a broad flat percolation area (with an invert level above the 1000 year predicted flood level), which will be located in the northwestern portion of the site, as detailed on Figures 2 attached.
- Creation of paved areas (concrete &/or asphalt) throughout the Proposed Asphalt Plant Subsite to minimise dust and allow for stormwater/surface water collection and treatment;

- Dust control will also be facilitated through the use of the wheel-wash facility, incorporating a dust-bagging plant, and storage of imported raw materials (for the Asphalt Plant) within covered sheds;
- Domestic effluent will be tankered offsite and disposed of at a licensed facility.

1.3 GUIDANCE

This report has been carried out using the following guidance:

- Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular NPW 1/10 & PSSP 2/10;
- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities. (Department of Environment, Heritage and Local Government, 2010);
- Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg (EC 2000);
- 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);
- 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);
- Flora (Protection) Order, 1999 (As amended 2016).
- Correspondence from the Development Applications Unit (DAU) (G Pre00340/ 2016 received 21 November 2016)

In addition, a detailed online review of published scientific literature and 'grey' literature was conducted. This included a detailed review of the National Parks and Wildlife Website (NPWS) including mapping and available reports for relevant sites and in particular sensitive qualifying interests described and their conservation objectives. The EPA Envision Map-viewer (www.epa.ie) and available reports were also reviewed.

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, 2000).

The 'Conservation Status' of a 'Natural Habitat' is defined as the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species.

The 'Conservation Status' of a 'Species' is defined as the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its population.

The 'Integrity' of a European Site is defined as the coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and/or populations of species for which the site is or will be classified.

'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.

1.4 APPROACH

As previously mentioned, there are four main stages in the AA process; the requirements for each depending on likely impacts to European Sites (cSAC/ SPA).

Stage One: Screening – the process which identifies the likely impacts upon a European Site. 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 on the European Site.

Stage Two: Appropriate Assessment – consideration is given if the impact of the project or plan would adversely affect the integrity of surrounding European Sites, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where adverse impacts have been identified, an assessment of the potential mitigation to reduce/minimise/avoid such impacts is required. This stage is the responsibility of the Planning Authority, which is informed by a Natura Impact Statement. This stage is required where uncertainty of effect arises or a potential effect has been defined which requires further procedures/ mitigation to remove uncertainty of a defined impact.

This NIS report considers likely impacts on European Sites of the project either alone or in combination with other plans and/or projects and considers whether these effects are likely to be significant. Based on the outcomes of the Ecology Assessments (including those undertaken as part of the Planning & Environmental Considerations Report, which also accompanies this Planning Application), detailed precautionary mitigation measures may be required.

Stage Three: Assessment of Alternative Solutions – the process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the European Site.

Stage Four: Assessment Where Adverse Impacts Remain – an assessment of compensatory measures where, in the light of an assessment of Imperative Reasons of Overriding Public Interest (IROPI), it is deemed that the project or plan should proceed.

Figure 1: **Regional Site Location Map**

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GENERAL LEGEND

LAND OWNERSHIP BOUNDARY

APPLICATION BOUNDARY

PROPOSED GORT TO TUAM MOTORWAY

SITE NOTICE LOCATION

X

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD
5. OS DISCOVERY SHEET NO'S: 1220, 1420

400m 0 400m 800m 1200m

Rev	Date	Description	By	Chkd.
A	20.02.2017	NIS ISSUE	MK	BR

Client:
JOHN MADDEN & SONS LTD.

Project:
Tonroe Quarry,
Development of Asphalt Plant and Restoration of Previously Quarried Area
NIS

Title:
Regional Site Location Map

Scale @ A1:	1:20,000	
Prepared by: MK	Checked: BR	Date: FEB 17
Project Director:	John P. Kelly	
Drawing Status:	NIS ISSUE	

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Drawing No.: Figure 1

Revision: A

2 DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 RECEIVING ENVIRONMENT

Tonroe Quarry is set within a wider landscape dominated by improved agricultural grassland and limestone-bedrock influenced calcareous grassland, juniper heath and hazel woodland. Landholdings immediately adjacent to the site are low-intensity agricultural grasslands and residential properties. The site is located within the Dunkellin and Kinvarra River Catchments. The closest surface water features are located to the north and south of the quarry and include Brackloon Lough (a small marl lake ca. 1.5 km to the south-west) and Caranavoodaun Turlough (ca. 1.1km to the north). The nearest watercourse is located to the southwest, the Aggard Stream, which is a first order tributary of the Dunkellin River. The river main channel is located ca. 4 km to the north. There is a local/private road (L-85664) leading into the Tonroe Quarry site at its northwestern corner, which is connected to the N18 Galway to Ennis road to the south.

The M18 Motorway construction is in progress approximately 0.5km to the north west of the site. To the south of the N18 is a significant area of calcareous grassland (Ardrahan Grasslands SAC), while to the north of the quarry approximately 100m from the site boundary is an area of broadleaved woodland (Castletaylor Complex SAC). The location of the site is shown on Figure 1.

2.2 PROJECT OVERVIEW

The current Planning Application is for:

- Development of an Asphalt Plant & Associated Works, which includes:

  - Use of an existing weighbridge and wheelwash;
  - Renovation of an existing staff office;
  - Erection of a Material Storage & Maintenance Building;
  - Erection and operation of an Asphalt Plant.

  The Asphalt Plant and associated works will be developed within the 'Proposed Asphalt Plant Subsite' (ca. 2.86 ha), located in the northern corner if the overall site boundary, as shown on Figure 2.

  John Madden & Sons Ltd. propose that a maximum of 80,000 tonnes/year of imported stone will be used to produce a maximum of 100,000 tonnes/year of asphalt/bituminous macadam at the site, as demand requires. The imported stone is to be combined with 20,000 tonnes per annum of other imported material, comprising sand, hard chip and bitumen, for production of asphalt/bituminous macadam onsite at the proposed Asphalt Plant. This imported material is to be sourced from local suppliers with a trip distribution ratio of 50:50 from the Galway / Limerick directions along the existing N18 and future operational M18 corridor.

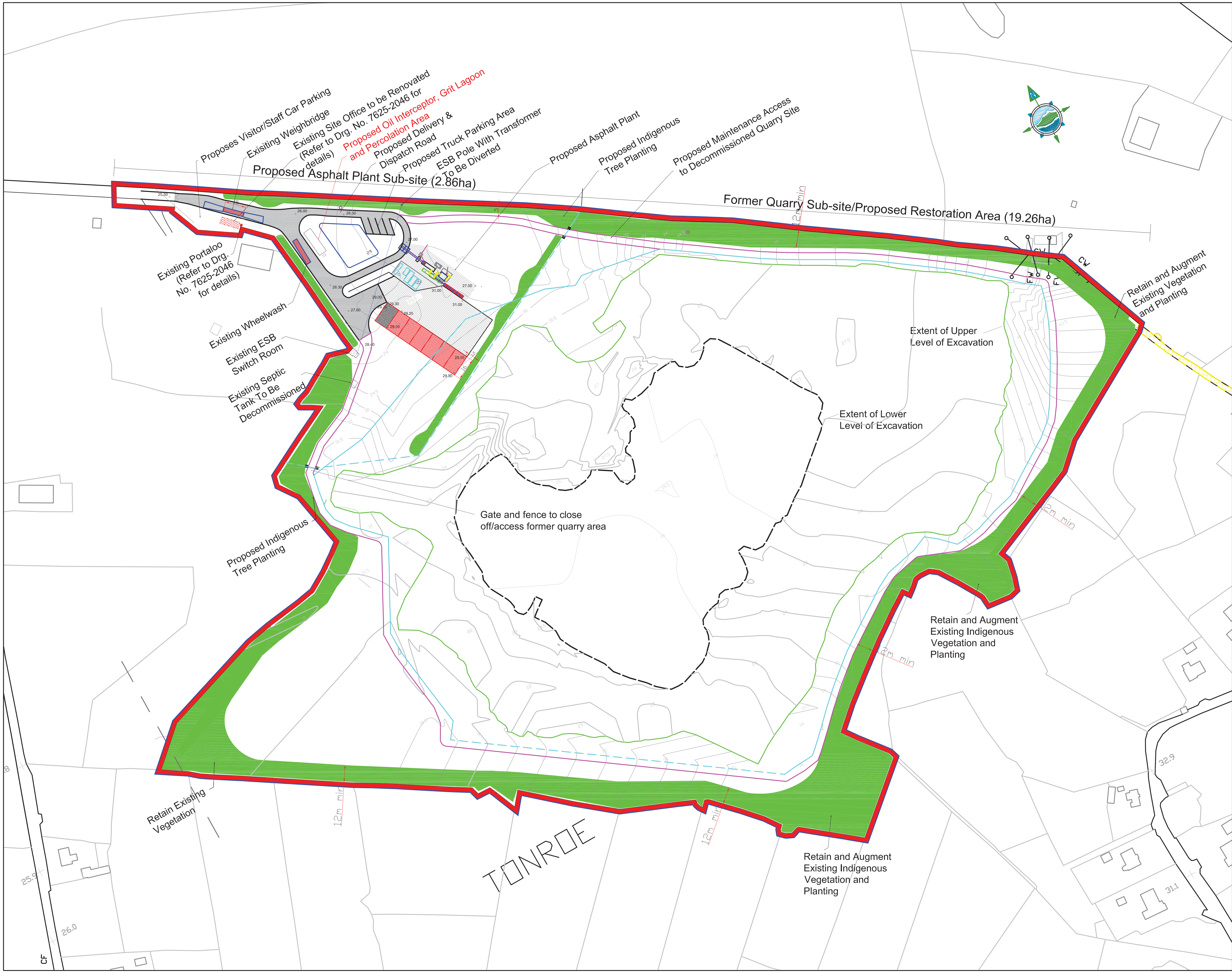
The proposed Asphalt Plant is essential infrastructure to ensure competition in the market and to allow John Madden & Sons Ltd. to be able to independently cater for the market when tendering particularly for public works, which is their principal market.

- Completion of Restoration of Previously Quarried Area (i.e. 19.26 ha Former Quarry Subsite/Proposed Restoration Area), as shown on Figure 2. The 'Proposed Restoration Plan for Previously Quarried Area' for this area is attached in Appendix A.

The topography of the application area varies from approximately 19.0 mOD at the lowest level of the quarry floor to approximately 43.0 mOD at the highest point. As the proposed Asphalt Plant is located well above the water table, outside of the Former Quarry Subsite/Proposed Restoration Area; there is no requirement for dewatering, working in water, or below the watertable. There is no proposal for any further extraction within the Former Quarry Subsite/Proposed Restoration Area.

The proposed Asphalt Plant will provide employment, both directly and indirectly, in the locality and wider region, including those employed directly on-site and those employed for haulage. Direct employment includes drivers, administration and maintenance personnel. Indirect employment is generated as a result of the asphalt/bituminous macadam production, in terms of contract transport operators, suppliers of products and services, such as fuel and oil suppliers, machinery suppliers and environmental monitoring, etc.

Figure 2: **Proposed Site Layout Plan**



Legend

Application Boundary	
Land Ownership Boundary	
Retain and Augment Existing Indigenous Vegetation and Planting	
Existing Security Fence	
Proposed Security Fence	
Upper Quarry Face	
Lower Quarry Face	
Access for Maintenance of Fence & Planting	

NOTES:

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES, ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES
5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chkd.
A	20.02.2017	NIS ISSUE	MK	BR

Client: John Madden & Sons Ltd.

Project: Tonroe Quarry, Proposed Asphalt Plant and Restoration of Previously Quarried Area NIS

Title: Proposed Site Layout Plan

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

Prepared by: MK | Checked: BR | Date: FEB 17

Project Director: John P. Kelly

Drawing Status: NIS ISSUE

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Drawing No.: Figure 2

Revision: A

2.3 DESCRIPTION OF PROJECT COMPONENTS

2.3.1 Development of an Asphalt Plant & Associated Works, in Former Quarry Processing/Dispatch Yard Area

John Madden & Sons Ltd. propose to develop an Asphalt Plant & Associated Works, in the Former Quarry Processing/Dispatch Yard Area (2.86 ha). No ecologically valuable habitats are present in this section of the Tonroe Quarry site.

The former infrastructure of weighbridge and wheelwash are still appropriately located and will be reused. The site office and staff/visitor car parking are also appropriately located and will be reused, following renovation.

The development will include the construction of a material storage and maintenance building.

The Asphalt Plant will be located, where the quarry processing plant had previously been located, as shown on Figure 2 attached.

The Asphalt Plant will use the crushed and screened rock imported to the site to produce asphalt/ bituminous macadam. Importation of binder, emulsions and sand/ aggregate will also be required. The rock product will be combined with sand, heated, and coated with a binder (bitumen). Binder and emulsions will be stored in bunded tanks as shown, on Figure 2. The temperature of the finished product must be sufficient to be workable after transport to the final destination. It will be stored in large electrically heated insulated steel containers from where it will be weighted into delivery vehicles.

The Asphalt Plant will consist of the following elements:

- Cold Feed System;
- Drying and Heating Section;
- Dust Collection System;
- Mixing Tower;
- Filter Feed System;
- Hot Mix Storage System;
- Bitumen Supply System;
- Control Cabin;
- Granulate Addition; and
- Fuel Tanks.

2.3.1.1 Plant and Equipment

The Asphalt Plant will have two loading shovels and the delivery/supply trucks, as well as the fixed plant.

2.3.1.2 Fuel Storage

Fuel used in the Asphalt Plant processes will be stored on site in a bunded fuel storage tank with a capacity of 80,000 L located in the northwest of the application area, near the site entrance, at the location shown on Figure 2. A secondary containment system, in the form of an impermeable concrete-lined bund, will be constructed around the tank, to ensure that any spillage during loading or any leakage is adequately contained within the bund. The capacity of the bund will be 110% of the volume of the tank. Any spillage will be collected and disposed of appropriately.

Machinery fuel will be stored in a bunded tank within the maintenance bay of the new Material Storage & Maintenance Building proposed.

Staff responsible for the Asphalt Plant and machinery fuel facilities, will be trained in proper fuel handling and spillage response procedures.

2.3.1.3 Sewerage and Waste Water Treatment

Portaloos will be provided adjacent to the site office in the northwest of the site (as shown on Figure 2). A contractor will be retained to remove and dispose of waste water off-site.

The existing septic tank on the site (as shown on Figure 2) will be decommissioned prior to commissioning of the Asphalt Plant.

2.3.1.4 Surface Water/Stormwater

With the exception of the quarry pit in the Former Quarry Subsite/Proposed Restoration Area, there are no surface water features within the Tonroe Quarry site and there are no current or proposed surface water discharges from the site.

An important factor in relation to water is the control and management of rainwater falling within the Proposed Asphalt Plant Subsite. Any surface water runoff from this area will be collected and directed to an oil interceptor, a grit settlement lagoon and a broad flat percolation area (with an invert level above the 1000 year predicted flood level), which will be located in the northwestern portion of the site, as detailed on Figures 2 attached.

Groundwater recharge to the underlying aquifers is diffuse (rainfall) directly into the aquifers where bedrock is present i.e. within the Former Quarry Subsite/Proposed Restoration Area.

2.3.1.5 Groundwater

The lower and middle floor levels of the quarry pit (Former Quarry Subsite/Proposed Restoration area) fill with water during the autumn and winter months, as groundwater levels rise. This water recharges to the underlying aquifer. The quarry floor dries out during the spring and summer period, as the groundwater table falls.

2.3.1.6 Vehicle Wheelwash Water

The wash water from the vehicle/wheelwash bay will be recycled in a closed system.

2.3.1.7 Drinking Water:

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

2.3.1.8 Site Services

Electricity, lighting and heating will all be provided via the electricity network to the site office and Asphalt Plant. A range of fire extinguishers (water, foam and CO_2) will be kept at the site office to deal with any localised small scale fires that might occur.

2.3.1.9 Solid Waste Management

John Madden & Sons Ltd., 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 Tonroe Quarry site will be minimised and managed in accordance with the relevant legislation and other controls in place. Good practice will be achieved when recycling used oils and greases, batteries, tyres, scrap metal and timber. John Madden & Sons Ltd. has a Waste Collection Permit issued under the Waste Management (Collection Permit) Regulations 2001 (WCP-MO-10-0651-01).

2.3.1.10 Site Security

Site security arrangements currently employed within the closed Tonroe Quarry site will be maintained and updated (where required) for the proposed developments. The current security arrangements include fencing around the entire extraction area of the site; a wall, a gate and hedgerow along the access road (L-85664 local/private road); and stone walls and hedgerows around the site boundary.

A new gate and new section of security fence is proposed to close off the access from the Proposed Asphalt Plant Subsite, to the Former Quarry Subsite/Proposed Restoration Area, as shown on Figure 2. The reinstated Former Quarry Subsite/Proposed Restoration 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 hedgeline 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 N18, with no views of the site from this road.

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

The site will be subject to routine visits from the Health and Safety Authority. John Madden & Sons Ltd. has a well established and successful on-site safety record.

2.3.1.11 Working Hours

The hours of operation at the Tonroe Quarry Asphalt Plant will be 07:00 to 19:00 Monday to Friday and 07:00 to 14:00 on Saturdays. Truck movements will be from 08:00 to 18:00 Monday to Friday and 08:00 to 13:00 on Saturdays. The Plant will not operate on Sundays or Public Holidays, unless warranted by exceptional circumstances.

The restoration works on the Former Quarry Subsite/Proposed Restoration Area is proposed to be undertaken within 12 months of grant of planning and prior to commissioning of the Asphalt Plant and will be carried out during the above proposed working hours.

2.3.1.12 Employment

John Madden & Sons Ltd. will provide employment, both directly and indirectly, in the locality and wider region.

Direct employment (approximately 5 No. full-time staff) will include drivers, administration and maintenance personnel

Indirect employment will be generated as a result of the Asphalt Plant, in terms of contract transport drivers, suppliers of products and services, such as fuel and oil suppliers, machinery suppliers, environmental monitoring, etc.

2.3.1.13 Traffic Control

All traffic will access the facility directly at the site entrance, located on the partially taken in charge L-85664 local/private road, which leads off the main N18 Galway to Ennis road, located approximately 800m from the site entrance.

Recent road improvements along the N18 in the vicinity of the L-85664 have improved the road surfacing and visibility of the road markings. Warning road signs are available on all approaches to the junction to the site, with adequate visibility available in both directions onto the N18 from the L-85664.

Traffic entering and exiting the Asphalt Plant will be managed to ensure safety is prioritised and congestion is minimised.

The proposed turning area mitigates against potential traffic congestion on the road and this area will also provide temporary parking for HGVs during operational hours.

John Madden & Sons Ltd. will ensure that vehicles leaving their operations are effectively cleaned and sprayed by a wheel and vehicle washing facility to prevent the spread of dust and aggregate on to the public highways. John Madden & Sons Ltd. will clean, when necessary, any dirt and debris from any road surfaces soiled as a result of spillage due to haulage to and from the site.

The predicted tonnage and trip generation from the Asphalt Plant facility is as follows:

Average Daily Total Movements (Two-Way): 88 HGVS & 16 LGVS = 104 vehicles
Peak Daily Total Movements (Two-Way): 120 HGVS & 22 LGVS = 142 vehicles

Total Tonnage IN = 100,000T
Total Tonnage IN = 100,000T

2.3.1.14 Site Roads and Parking

All trucks entering the site will be confined within the site boundary through the internal road network and traffic management plan. The proposed delivery and dispatch road is shown on Figure 2.

Provision for visitor and staff parking will be provided within the existing paved car parking area, located next to the existing site office, as shown on Figure 2.

2.3.1.15 Site Management

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

2.3.2 Completion of Restoration of the Former Quarry Subsite

The completion of restoration within the Former Quarry Subsite (19.26 ha) was proposed to fulfil the pre-existing and outstanding condition requirements of Planning Permission (Galway Co. Co. Reg. Ref. 01/3587 / An Bord Pleanála Planning Ref. PL 07.129246), which expired in 2009. Due to the liquidation of the previous operator of the quarry (i.e. Goode Concrete Ltd.), the required restoration of the Former Quarry Subsite was never completed.

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 will be required around the perimeter fencing at the upper level of the quarry site, and thus the existing maintenance access track will be maintained, as shown on Figure 2.

The proposed restoration of the Former Quarry Subsite will include the removal of select inert stockpiles and the spreading of stockpiles of suitable substrate, in select areas, to promote growth. Site surveys have not identified significant quantities of waste or rubbish within the Former Quarry Subsite.

No works are required within the lower floor level of the quarry pit which is subject to groundwater inundation during autumn and winter months. In the intervening eight 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 middle bench of the quarry pit has considerable stockpiles of processed single aggregate stone, some site won and some imported. The inert stockpiles have not and will not naturalise and will be removed from the Former Quarry Subsite/Proposed Restoration Area for use in the proposed Asphalt Plant. It is thought that stockpiles that show slow colonisation are being prevented from colonising due

to being unstable as they are in steep spoil heaps. These stockpiles will be spread in select areas of the middle bench to promote growth.

The upper bench of the quarry, at original ground level, which was not quarried, has very considerably recolonised with grasses, furze, bushes and trees. Only minimal supplementary planting of hazel has been proposed here, to increase screening and inhibit competition by non-native species.

The proposal with regard to restoration is therefore:

- Remove inert stockpiles for use in proposed Asphalt Plant from middle quarried benches;
- Spread stockpiles of suitable material thinly in select areas of the middle bench to promote colonisation of plants;
- Retain and augment existing boundary vegetation and planting;
- Secure and maintain the boundary walls and security fencing;
- Maintain the maintenance access track for maintenance of boundary walls, fences and planting;
- Allow nature to continue to naturalise the quarry pit floors and walls;
- Undertake no work in water or in the watertable layer to ensure that there will be no hydrological or hydrogeological impacts on the wider area or any of the designated sites therein;
- Erect fence and gate to close off the Former Quarry Subsite/Proposed Restoration Area from Proposed Asphalt Plant Subsite; and
- Ensure minimum interference to areas that have undergone natural recolonisation and restoration as possible, to include habituation of the site by Peregrine Falcon (*Falco peregrinus*) a Habitats Directive Annex I species.

The above work will be begun/ undertaken within 12 months of grant of planning and prior to commissioning of the Asphalt Plant.

A full description of the restoration works is provided in the 'Proposed Restoration Plan For Previously Quarried Area', attached in Appendix A.

2.3.2.1 Plant and Equipment

2 no. 30 tonne dump trucks and 2 no. backhoe excavators will be required during the restoration works of the Former Quarry Subsite/Proposed Restoration Area, to remove the historic stockpiles of processed stone from the middle quarried bench and to transport the material to the proposed Asphalt Plant for use.

3 STAGE 1 SCREENING FOR APPROPRIATE ASSESSMENT

3.1 INTRODUCTION TO SCREENING

This stage of the process identifies whether there is the potential for significant impacts upon European Sites from the proposed project, either alone or in combination with other projects or plans. The screening phase was progressed in the following stages. A series of questions are asked during the Screening Stage of the AA process in order to determine:

- Whether the project can be excluded from AA requirements because it is directly connected with or necessary to the management of a European Site;
- Whether the project 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.

An important element of the AA process is the identification of the 'Qualifying Interests' of European Sites requiring assessment. Qualifying Interests are the habitats and species for which each European Site has been designated and afforded protection. It is also vital that the threats to the ecological/environmental conditions that are required to support Qualifying Interests are considered as part of the assessment. Site specific conservation objectives have been designed to define favourable conservation status for a particular habitat or species at that site. According to the European Commission interpretation document 'Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC', paragraph 4.6(3) states:

> *"The integrity of a site involves its ecological functions. The decision as to whether it is adversely affected should focus on and be limited to the site's conservation objectives."*

Favourable conservation status of a habitat is achieved when:

- Its natural range, and area it covers within that range, are stable or increasing;
- The specific structure and functions which are necessary for its long term maintenance exist and are likely to continue to exist for the foreseeable future;
- The conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future;
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long term basis.

3.1.1 Desktop Studies

The Ecological desktop study completed for the proposed development comprised the following elements:

- Identification of all European Sites (SAC's & SPA's,) within 15 km of the proposed development site (see Figure 3), with identification of potential pathway links for specific sites (if relevant) greater than 15km from the proposed development site.
- Review of the NPWS site synopsis and conservation objectives for European Sites with identification of potential pathways from the proposed development;
- Review of records of rare and protected flora and fauna, including those obtained from an NPWS data request, and those available in NPWS reports and on the National Biodiversity Data Centre (NBDC) website;
- Review of available EPA water quality reports and mapping[1] and Water Framework Directive[2] Water Quality data;
- Review of Ordnance Survey maps and aerial photography in order to determine broad habitats that occur within the study area; and
- Review of any other relevant ecological reports and literature, including previous EIS reporting (TOBIN, 2015; Declan Brassil, 2001[3]) for the former development and former proposed development at the site.

3.1.2 Consultation

An Environmental Impact Statement (including an EcIA) was produced (by TOBIN) for this site in 2015. It was produced to accompany a Planning Permission Application by John Madden & Sons Ltd. for the continuation of quarrying works on the site, with an extraction area of 15.95 ha, and for the development of an Asphalt Plant (Galway Co. Co. Reg. Ref. 15/707). This planning application was withdrawn on the 04 March, 2016.

As part of the 2015 EIA, TOBIN undertook a process of consultations with Galway County Council; various statutory bodies and interested parties. Consultation letters were issued to the Development Applications Unit (DAU), in the Department of Arts, Heritage & the Gaeltacht and to the National Parks and Wildlife Service (NPWS) on the 06 January 2015. The primary objective of the consultation was to aid scoping of the EIA/EIS (including an EcIA) and to allow the parties to highlight issues of concern prior to completion of the application. A copy of correspondence sent to and received from the above consultees is included in Appendix B '2015 EIA Statutory Consultee/Third Party Reponses'.

Local NPWS staff were contacted by TOBIN ecologists on 27 January 2015; however they had no specific knowledge of the site. A response was received from the Manager, Development Applications Unit (DAU), Department of Arts, Heritage & the Gaeltacht on 10 February 2015 which noted the following:

- The EIS should assess the likely significant effects of the proposed development on the environment, taking the cumulative effects of past development at the site, and of other projects, into account;

[1] http://gis.epa.ie/Envision/
[2] http://www.wfdireland.ie/
[3] Declan Brassil & Co. Ltd (2001) EIS for Tonroe Quarry, Ardrahan, Co. Galway

- An NIS is required for the proposed development, as three SAC's within 0.3-1.7km of the quarry are selected for the conservation of the groundwater dependant Annex I priority habitat – 'Turloughs';
- They further highlighted ecological receptors that should be considered and surveys required.

The Manager, Development Applications Unit (DAU), Department of Arts, Heritage & the Gaeltacht issued a response to the Planning Section, Galway County Council, dated 16 July 2015, in response to the 2015 Planning Application (& associated EIS & NIS). A copy of this response is attached in Appendix B 'Manager DAU Response to the Planning Section, Galway County Council Re 2015 Planning Application (Galway Co. Co. Reg. Ref. 15/707)'. The following summarised points were highlighted in the consultation letter:

- Baseline data has been collected for the N18 road development, specifically in relation to bats which can be used to inform the assessment for the development;
- A number of European Sites are located within 0.3 – 1.7 km from the development site;
- Up to date Conservation Objectives should be used for all sites;
- Potential impacts arising via groundwater, dust, noise and vibration are identified as having the potential for adverse effects on the qualifying interests of designated sites;
- Further assessment is required in relation to Lesser horseshoe bats.

The DAU's previous and most recent concerns have been carried forward to the current planning application and cognisance has been taken of the DAU feedback, with measures and concerns acknowledged and incorporated into the current planning application (including this NIS and the associated PECR). Further extraction at the Tonroe Quarry site is therefore no longer proposed in this present application and the restoration of the Former Quarry Subsite/Proposed Restoration Area (approximately 19.26 ha.) will be undertaken as set out in this application. In view of the concerns raised by the DAU, the stormwater and paving details for the proposed Asphalt Plant have also been revised to address specific concerns for the avoidance of water quality impacts and interactions with groundwater. Water levels in the site have been continuously monitored during the period of November 2015 to June 2016 to expand on baseline data for this assessment.

Prior to the completion of the present NIS, an NIS Scoping Letter issued to Galway County Council (Planning & Environment Sections), DAU – DAHRRGA, and the NPWS (copies of letters issued attached in Appendix D. A response was received from the DAU (Ref. G Pre00340/ 2016) (attached in Appendix D). The following summarised points were highlighted in the consultation letter:

- Earlier submissions in relation to previous planning applications on the site should be taken in to account (as above);
- The connection of the site and quarrying activities with past environmental impact assessment requirements, including mitigation measures in the 2001 EIS, and the planning conditions of An Bord Pleanála, should be taken in to account;
- Existing EU and Irish guidance on EIA and appropriate assessment should be followed in general terms when carrying out assessments required, with cognisance of changes in the interpretation and application of directives as applicable;
- The assessment should be based on full and detailed descriptions of all parts of the project;

- Full details of restoration proposals and mitigation measures should be provided and shown in maps and drawing, as appropriate, for all specific elements and stages of the projects.;
- The Restoration Plan should be prepared based on and informed by; a thorough survey of the current ecological and environmental baseline of the site, including the margins and screening; the previous/ original ecological and environmental condition of the site; and a thorough review of all ecological and environmental mitigation measures and conditions which applied to development of this site, including those outlined in the 2001 EIS and the Board's grant of permission in 2003. The restoration plan should include clear and specific aims and objectives and measures to archive them within an appropriate, set timeframe. A system should also be in place for corrective action to be taken where necessary
- In relation to the assessment and analysis of potential cumulative or in combination effects of other plans or projects the DUA recommended numerous projects and plans that should be included, including the M17/ M18 Gort to Tuam motorway.
- Annex Habitat potential should be taken in to account within the restoration plan;
- In order to characterise and evaluate the water body within the quarry floor and provide a baseline for future ecological monitoring, aquatic macrophyte, charopyhte and invertebrate surveys are required.
- Ongoing monitoring of groundwater levels and water quality should be carried out.
- As the current site supports protected species (Peregrine falcon, Sand martin and potentials bats and badgers), the necessary surveys should be carried out to establish the presence of any such species or their key habitats and to inform the need for any mitigation measures, or derogation licences in circumstances where damage or disturbance cannot be avoided.

A meeting was held between NPWS representative Julie Fossitt and TOBIN hydrologist and ecologists Emma Sweeney and Padraig Cregg on the 16th of February 2017. The current proposal was discussed with particular emphasis on the proposed Restoration Plan. Julie made numerous suggestions of items that should be addressed within the restoration plan, namely;

- Results of previous ecological field surveys and monitoring on site should be included in the Restoration Plan to provide a baseline for future monitoring of the success of the Restoration Plan.
- A description of the site prior to any quarrying works should be included
- A description of any bat surveys carried out on site to date should be included
- Aquatic ecology surveys should be carried out within the lower bench of the quarry, in order to characterise and evaluate the water body within the quarry floor and provide a baseline for future ecological monitoring, aquatic macrophyte, charopyhte and invertebrate surveys are required.
- A full description of the proposed treatment of surface water within the Asphalt Plant Subsite should be included to ensure the proposal is adequate
- There is potential for the Annex I Habitat 'Petrifying springs with tufa formation (Cratoneurion) [7220]', this should be discussed within the Restoration Plan

3.1.3 Ecological Field Surveys

A series of Ecological Field Surveys have been conducted for the previous and current planning applications for the Tonroe Quarry site. Site surveys were carried out on the 8th October 2014, 20th March 2015, 12th May 2015 and 20th October 2016; with additional survey work completed for monitoring of water levels within the Former Quarry Subsite/Proposed Restoration Area between November 2015 and June 2016. 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 E.

3.1.3.1 Terrestrial Habitats and Flora

A 'Habitat Survey' was conducted within the Tonroe 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*. Plant identification and nomenclature principally follows Webb *et al*. (1996)[4]. Grass and fern identification and nomenclature was further assisted by Rose (1989)[5]. 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)[6].

3.1.3.2 Terrestrial Fauna

Mammal Surveys involved recording sightings, tracks and signs (droppings, resting places, burrows/setts/dens) of mammal species during the site walkover surveys. Survey guidelines for protected species followed NRA (2009) - *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*. Sightings of invertebrates, reptiles and amphibians were also recorded. Areas of the plant Devil's-bit scabious *Succisa pratensis* were searched for the presence of larval webs of the marsh fritillary butterfly during the October 2014 site visit.

The surveys on 20 March, 23 April and 12 May 2015 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, 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[7]. In addition, information was sought regarding the past or current use of the Former Quarry Subsite/Proposed Restoration Area by Peregrine falcon or other protected raptor species.

[4] Webb, Parnell & Doogue (1996). *An Irish Flora*.
[5] Rose (1989) *Colour Identification Guide to the Grasses, Sedges, Rushes and Ferns of the British Isles and north-western Europe*.
[6] Atherton, Bosanquet & Lawley (2010) Mosses and Liverworts of Britain and Ireland a field guide. British Bryological Society
[7] Colhoun K. & Cummins S. (2013). *Birds of Conservation Concern in Ireland 2014-2019. Irish Birds 9:523-544 (2013)*

3.1.3.3 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 the 12th May 2015 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 5 No. locations within the Tonroe Quarry site;
- Fringing Hazel scrub and remnants within the Study Area were surveyed;
- The roadways to the west of the Tonroe Quarry site were driven with the bat detector so as to record any signs of bat activity[8].

Ecological Site Surveys and there was no evidence of any bat roost (e.g. bat droppings). The bat activity survey found no evidence of bats using the Tonroe Quarry site.

3.2 IDENTIFICATION OF RELEVANT EUROPEAN SITES

An initial distance of 15 km from the proposed site boundary was used for consideration of European Sites, in accordance with the Department of Environment, Heritage and Local Government guidance (DoEHLG, 2010). Figure 3 identifies the designated European Sites that lie within 15 km of the Tonroe Quarry site. In addition to the 15km buffer, European Sites in excess of 15 km buffer with potential linkages to the proposed development were screened for potential impacts using the source-pathway-receptor model, taking account of the conservation objectives for these designations. Designated Natura 2000 sites within the zone of influence of the proposed development, including the Qualifying Interests of each site, are detailed below in Table 1. There are no sites designated for nature conservation within the footprint of the proposed development site; therefore none of the European Sites listed below are within, or directly adjacent to, the boundary of the proposed development site.

[8]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.

Figure 3: Designated Conservation Areas within 15 km Buffer

Ballycuirke Lough
Lough Corrib
Lough Corrib
Lough Corrib SPA
Moycullen Bogs NHA
Kiltullagh Turlough
Cregganna Marsh SPA
Cregganna Marsh NHA
Rahasane Turlough
Rahasane Turlough
Rahasane Turlough SPA
Inner Galway Bay SPA
Galway Bay Complex
Galway Bay Complex
Castletaylor Complex
Castletaylor Complex
Lough Fingall Complex
Lough Fingall Complex
Kiltiernan Turlo
Application Boundary
Kiltiernan Turlough
Ardrahan Grassland
Peterswell Turlough
Peterswell Turlough
Cahermore Turlough
Ballinduff Turlough
Caherglassaun Turlough
Caherglassaun Turlough
Lough Coy
Carrowbaun, Newhall And Ballylee Turloughs
Kiltartan Cave (Coole)
Coole-Garryland SPA
Coole-Garryland Complex
Coole-Garryland Complex
Moneen Mountain
Moneen Mountain
Turloughnagullaun
East Burren Complex
East Burren Complex
Polldugh Cave, Gort
Termon Lough
Termon Lough
Lough Cutra
Lough Cutra
Lough Cutra SPA
Gortacarnaun Wood
Drummin Wood
Sonnagh Bog
Sonnagh Bog
SLIEVE AUGHTY MOUNTAINS SPA
Slieve Aughty Bog NHA
Lough Atorick District Bogs NHA
Raford River Bog NHA
Lough Rea
Lough Rea
Lough Rea SPA
15km

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Legend

- Application Boundary
- 15 km Buffer from Study Area
- Special Area of Conservation
- Special Protection Areas
- Natural Heritage Area
- Proposed Natural Heritage Area

0 1 2 4
Kilometres

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	20.02.2017	NIS	F. H	E.S.

Client:
JOHN MADDEN & SONS LTD.

Project:
Tonroe Quarry
Development of Asphalt Plant and Restoration of Previously Quarried Area
NIS

Title:
DESIGNATED CONSERVATION AREAS WITHIN 15KM BUFFER

Scale @ A3: 1:125,000

Prepared by:	Checked:	Date:
F. Healy	E. Sweeney	February 2017

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Figure 3

Issue: A

Table 1: European Sites and their Qualifying Interests, Conservation Objectives and Threats and Pressures

European Site	Qualifying Interests
Castletaylor Complex SAC [000242] Site includes Caranavoodaun turlough, woodland and mosaics of limestone pavement, grassland and heath. Distance: 100 m to north	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]
Ardrahan Grassland SAC [002244] 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. Distance: 250m to southwest	Alpine and Boreal heaths [4060] *Juniperus communis* formations on heaths or calcareous grasslands [5130] Limestone pavements [8240]
Kiltiernan Turlough SAC [001285] This site comprises a relatively flat basin which lies approximately 2 m below road level, and includes about eight further depressions which are joined in times of high water. The red data book species fen violet *Viola perscicfolia* is known from the site. Distance: 1.3 km to west	Turloughs [3180]
Lough Fingall Complex SAC [000606] 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: 1.7 km to northwest	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]
Rahasane Turlough SAC & pNHA [000322] 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 V*iola perscicfolia* is known from the site. Distance: 3.7 km north	Turloughs [3180]
Rahasane Turlough SPA [004089] 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. Distance: 3.7 km north	Whooper Swan (*Cygnus cygnus*) [A038] Wigeon (*Anas penelope*) [A050] Golden Plover (*Pluvialis apricaria*) [A140] Black-tailed Godwit (*Limosa limosa*) [A156] Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395] Wetlands & Waterbirds [A999]
Inner Galway Bay SPA [004031] 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: 5.2 km northwest	Great Northern Diver (*Gavia immer*) [A003] Cormorant (*Phalacrocorax carbo*) [A017] Grey Heron (*Ardea cinerea*) [A028] Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] Wigeon (*Anas penelope*) [A050] Teal (*Anas crecca*) [A052] Shoveler (*Anas clypeata*) [A056] Red-breasted Merganser (*Mergus serrator*) [A069] Ringed Plover (*Charadrius hiaticula*) [A137] Golden Plover (*Pluvialis apricaria*) [A140] Lapwing (*Vanellus vanellus*) [A142] Dunlin (*Calidris alpina*) [A149] Bar-tailed Godwit (*Limosa lapponica*) [A157] Curlew (*Numenius arquata*) [A160] Redshank (*Tringa totanus*) [A162] Turnstone (*Arenaria interpres*) [A169] Black-headed Gull (*Chroicocephalus ridibundus*) [A179]

European Site	Qualifying Interests
	Common Gull (*Larus canus*) [A182] Sandwich Tern (*Sterna sandvicensis*) [A191] Common Tern (*Sterna hirundo*) [A193] Wetlands & Waterbirds [A999]
Galway Bay Complex SAC [000268] 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: 5.4 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 maritimae) [1330] Otter (*Lutra lutra*) [1355] Common seal (*Phoca vitulina*) [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 (*Cladium mariscus*) and species of the Caricion davallianae* [7210] Alkaline fens [7230]
Coole-Garryard Complex SAC [004107] 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 *Limosella aquatic* 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, 1999. Distance: 5.5 km south	Natural euthrophic lakes with Magnopotamion or Hydrocharition-type vegetation [3150] Turloughs [3180] Rivers with muddy banks with Chenopodion 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]
Ballinduff Turlough SAC [002295] Site supports a wide range of turlough habitats. The presence of the shoreweed *Littorella uniflora* is notable. Distance: 5.7 km south	Turloughs [3180]
Cahermore Turlough SAC [002294] 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 southwest	Turloughs [3180]
Peterswell Turlough SAC [000318] 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 6.5 km southeast	Turloughs [3180]
Carrowbaun, Newhall & Ballylee Turloughs SAC [002293} 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 southeast	Turloughs [3180]
Lough Coy SAC [002117] Lough Coy is an excellent example of a eutrophic (nutrient-rich) turlough. The extreme water fluctuation supports a	Turloughs [3180]

European Site	Qualifying Interests
distinctive zonation of vegetation and provides many niches for specialist plants. It is an important site for wintering waterfowl. Distance: 7.1 km southeast	
Caherglassaun Turlough SAC [000238] 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: 7.9 km southwest	Lesser horseshoe bat (*Rhinolophus hipposideros*) [1303] Turloughs [3180]
Slieve Aughty Mountains SPA [004168] This large site comprises a range of upland habitats. It is a stronghold foe hen harrier and supports the second largest concentration in the country. It also supports a breeding population of Merlin. Distance: 8.3 km southeast	Hen Harrier (*Circus cyaneus*) [A082] Merlin (Falco columbarius) [A098]
Cregganna Marsh SPA [004142] 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	Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]
East Burren Complex SAC & pNHA [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. Distance: 10 km southwest	Marsh fritillary (*Euphydryas aurinia*) [1065] Lesser horseshoe bat (*Rhinolophus hipposideros*) [1303] Otter (*Lutra lutra*) [1355] 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 *Callitricho-Batrachion* vegetation [3260] 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] 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]
Sonnagh Bog SAC [001913] Sonnagh Bog is important as a good example of an intact, lightly grazed, highland blanket bog. Distance: 11.4 km southeast	Blanket bog (*active only) [7130]
Lough Cutra SAC [000299] 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: 14.2 km south	Lesser horseshoe bat (*Rhinolophus hipposideros*) [1303]
Lough Cutra SPA [004056] This site is of particular importance for its long-established breeding colony of Cormorant. It is of regional importance for	Cormorant (*Phalacrocorax carbo*) [A017]

European Site	Qualifying Interests
wintering waterfowl. The regular occurrence of Whooper Swan, albeit in low numbers, is of note. Distance: 14.2 km south	
Lough Rea SAC [000304] Lough Rea is a hard water lake fed by springs and a stream. Some stoneworts have been recorded from the site. Distance: 14.6 km east	Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. [3140]
Lough Rea SPA [004134] 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: 14.6 km east	Shoveler (*Anas clypeata*) [A056] Coot (*Fulica atra*) [A125] Wetlands & Waterbirds [A999]
Termon Lough SAC [001321] 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	Turloughs [3180]

3.3 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 (proposed development) 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 proposed 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 proposed development both in isolation and potentially in combination with other plans or projects (Table 2). 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.

3.3.1 Potential for Direct Impacts

Taking account of the separation distance between the proposed development site and the closest Natura 2000 sites, there is no potential for direct impacts affecting any European Site. The closed Designated Site (Castletaylor Complex SAC) is located approximately 100 m to the north.

3.3.2 Potential for Indirect Impacts

Potential indirect impacts arising from the proposed development are identified with respect to the qualifying interests of designated European sites and their qualifying interests (Table 2). Taking account of the size and scale of the proposed development, 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 proposed development site; and aquatic and terrestrial SACs which occur at a distance or outside of the surface water and groundwater body of the proposed development. The following indirect effects arising from the proposed development are considered as follows:

- Dust and other emissions from vehicles/machinery arising from the proposed Asphalt Plant & associated 2 no. loading shovels and the delivery/supply trucks; 2 no. 30 tonne dump trucks and 2 no. backhoe excavators which will be required during the restoration of the Former Quarry Subsite/Proposed Restoration Area. This equipment is required to remove the historic stockpiles of processed stone from the middle quarried bench and to transport the material to the Asphalt Plant for use;
- Personnel vehicles;
- Noise from vehicles/machinery (detailed above);
- Inappropriate lighting at Asphalt Plant impacting nocturnal foraging species such as bats;
- Uncontrolled emissions to surface water or groundwater (from Proposed Asphalt Plant Subsite) impacting sensitive aquatic receptors;
- Introduction and/or spread of non-native invasive species within the proposed development site, extending to roadside and designated European Sites.

The potential for significant adverse effects with respect to pathways for impacts between the development and designated Natura 2000 sites is presented in Table 2 below.

3.3.3 Potential In-Combination Effects

The Galway County Council planning website was reviewed for any significant developments currently in planning in the vicinity of the proposed development at the Tonroe Quarry site. No other developments, granted or proposed, were identified as having potential to result in cumulative effects with the proposed development, taking account of the nature of the proposed works, located within the existing Tonroe Quarry site and the absence of interactions with other plans or projects.

In relation to the assessment and analysis of potential cumulative or in combination effects of other plans or project, a review was carried out of the Office of Public Works (OPW) [9] website and the Galway County Council Development Plan[10], to identify any flood relief/ arterial drainage schemes, land use changes or road schemes that may potentially impact the receiving environment of the quarry. All plans were sufficiently removed from the site therefore no works with potential for cumulative or in combination 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 M17/M18 Gort to Tuam Motorway scheme passes ca. 1 km to the northwest of Tonroe Quarry site. The construction of this road scheme commenced in 2015 and is due for completion in 2018. The current proposal, which does not include quarry excavation, will not interact with the potential impacts identified with respect to the construction phase of the road development; therefore potential interactions leading to cumulative impacts which may affect the qualifying interests of the designated sites have not been identified.

[9] http://www.opw.ie/en/flood-risk-management/operations/flooddefenceschemes/
[10]http://www.galway.ie/en/media/1.%20Proposed%20Variation%20No.1%20to%20Galway%20CDP%20-%20Written%20Statement.pdf

Table 2: Screening Impact Assessment of European Sites and their Qualifying Interests

European Site	Qualifying Interests	Description of potential impacts from the proposed development	Potential for significant adverse Project effects?	Potential for significant adverse in-combination effects?
Castletaylor Complex SAC 100 m north	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 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 be impacted by dust emissions.	Pathways for potential impacts identified.	With the exception of groundwater interactions, pathways for in-combination effects limited and not considered significant.
Ardrahan Grassland SAC 250 m southwest	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 pathways for potential significant adverse effects	No pathways for potential significant adverse effects
Kiltiernan Turlough SAC 1.3 km west	Turloughs [3180]	The existing quarry and groundwater connection at the site gives rise to the potential for groundwater quality impacts with respect to turlough habitats.	Pathways for potential impacts identified.	With the exception of groundwater interactions, pathways for in-combination effects limited and not considered significant.
Lough Fingall Complex SAC 1.7 km northwest	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]	The existing quarry and groundwater connection at the site gives rise to the potential for groundwater quality impacts with respect to turlough habitats. The site synopsis notes that the woodland surrounding the roost site provides suitable foraging habitat within a short radius of the day roost site. There is little or no suitable foraging habitat within the quarry site for Lesser horseshoe bat. However this species is considered following the Lesser horseshoe bat Appropriate Assessment Guidelines, as it is within 6 km of the site (Bat Conservation Ireland, 2012)[11].	Pathways for potential impacts identified with regard to turlough habitats and Lesser horseshoe bats.	With the exception of groundwater interactions, pathways for in-combination effects limited and not considered significant.
Rahasane Turlough SAC 3.7 km north	Turloughs [3180]	The proposed development does not give rise to pathways for impacts due to the distance of separation. Groundwater flows from Ardrahan are not in the direction of the Rahasane	No pathways for potential significant	No pathways for potential significant adverse effects

[11] Bat Conservation Ireland (2012) Bats and Appropriate Assessment Guidelines, Version 1, December 2012. Bat Conservation Ireland, www.batconservationireland.org.

European Site	Qualifying Interests	Description of potential impacts from the proposed development	Potential for significant adverse Project effects?	Potential for significant adverse in-combination effects?
		Turlough.	adverse effects	
Rahasane Turlough SPA 3.7 km north	Whooper Swan (*Cygnus cygnus*) [A038] Wigeon (*Anas penelope*) [A050] Golden Plover (*Pluvialis apricaria*) [A140] Black-tailed Godwit (*Limosa limosa*) [A156] Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395] Wetlands & Waterbirds [A999]	The proposed development does not include foraging or suitable roosting habitat for the qualifying interests of this site. Neither are there pathways for noise or disturbance impacts due to the distance of separation. Groundwater flows from Ardrahan are not in the direction of the Rahasane Turlough.	No pathways for potential significant adverse effects	No pathways for potential significant adverse effects
Coole-Garryard Complex SAC 5.5 km south	Natural euthrophic lakes with Magnopotamion or Hydrocharition-type vegetation [3150] Turloughs [3180] Rivers with muddy banks with *Chenopodion 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]	Given the distance involved and accounting for the fact that this designation is outside of the Clarinbridge groundwater body in which the proposed development is located[12], there is no potential for significant impacts on this site.	No pathways for potential significant adverse effects	No pathways for potential significant adverse effects
Ballinduff Turlough SAC 5.7 km south	Turloughs [3180]	Given the distance involved and accounting for the fact that this designation is outside of the Clarinbridge groundwater body in which the proposed development is located, there is no potential for significant impacts on this site.	No pathways for potential significant adverse effects	No pathways for potential significant adverse effects
Cahermore Turlough SAC 6.5 km southwest	Turloughs [3180]	Given the distance involved and accounting for the fact that this designation is outside of the Clarinbridge groundwater body in which the proposed development is located, there is no potential for significant impacts on this site.	No pathways for potential significant adverse effects	No pathways for potential significant adverse effects
Peterswell Turlough SAC 6.5 km southeast	Turloughs [3180]	Given the distance involved and accounting for the fact that this designation is outside of the Clarinbridge groundwater body in which the proposed development is located, there is no potential for significant impacts on this site.	No pathways for potential significant adverse effects	No pathways for potential significant adverse effects
Carrowbaun, Newhall & Ballylee	Turloughs [3180]	Given the distance involved and accounting for the fact that this designation is outside of the Clarinbridge groundwater	No pathways for potential significant	No pathways for potential significant adverse effects

[12] https://www.gsi.ie/NR/rdonlyres/84F3A42C-475C-420A-B469-E94EC98E3DFE/0/Clarinbridge.pdf

European Site	Qualifying Interests	Description of potential impacts from the proposed development	Potential for significant adverse Project effects?	Potential for significant adverse in-combination effects?
Turloughs SAC		body in which the proposed development is located, there is no potential for significant impacts on this site.	adverse effects	
Lough Coy SAC 7.1 km southeast	Turloughs [3180]	Given the distance involved and accounting for the fact that this designation is outside of the Clarinbridge groundwater body in which the proposed development is located, there is no potential for significant impacts on this site.	No pathways for potential significant adverse effects	No pathways for potential significant adverse effects
Caherglassaun Turlough SAC 7.9 km southwest	Lesser horseshoe bat (*Rhinolophus hipposideros*) [1303] Turloughs [3180]	The Lesser horseshoe bat roost sites within this SAC is over 6 km from the proposed development (Bat Conservation Ireland, 2012). Given the distance involved and accounting for the fact that this designation is outside of the Clarinbridge groundwater body in which the proposed development is located, there is no potential for significant impacts on this site.	No pathways for potential significant adverse effects	No pathways for potential significant adverse effects

3.4 STAGE 1 SCREENING CONCLUSION

The proposed development is not located within or directly adjacent to any Natura 2000 site. The Appropriate Assessment Stage 1 Screening process identified potential impacts arising which would have the potential for indirect adverse effects on the qualifying interests of the following designated sites:

- Castletaylor Complex SAC;
- Kiltiernan Turlough SAC;
- Lough Fingall Complex SAC.

Impacts are identified with respect to the groundwater connection between the proposed development site and the turlough habitats within these European Sites which, like the proposed development, are located within the Clarinbridge Groundwater Body. Pollution of groundwater from suspended solids or uncontained pollutants has the potential to negatively affect sensitive aquatic habitats that are qualifying interests of Castletaylor Complex SAC, Kilternan Turlough SAC and Lough Fingall Complex SAC.

Any groundwater quality impacts would be limited in scale such that impacts would not have any implications for habitats or species for which these sites are designated with the exception of groundwater-dependant habitats, and the mobile Lesser horseshoe bat.

Through an assessment of the pathways for effects and an evaluation of the project, taking account of the processes involved and the distance of separation between other Natura 2000 designations in the wider study area, it has been evaluated that there are no likely significant adverse effects on the qualifying interests of any other designated European Site.

The potential for water quality impacts to adversely affect Turlough habitats within SAC sites located within the Clarinbridge Groundwater Body, results in the requirement for the progression to Stage 2 of Appropriate Assessment reporting (i.e. NIS). The effects of the proposed development in combination, or cumulatively, with other plans and proposals affecting groundwater quality within the Clarinbridge Groundwater Body will require evaluation as part of the NIS process.

4 STAGE 2 APPROPRIATE ASSESSMENT

4.1 INTRODUCTION

This stage of the AA process, often referred to as Stage 2, assesses potential impacts of the proposed 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 proposed development gave rise to the *potential* for significant adverse effects on the following designated Natura 2000 sites:

- Castletaylor Complex SAC;
- Kiltiernan Turlough SAC;
- Lough Fingall Complex SAC.

4.1.1 Impact Characteristics and Evaluation

Potential impacts arising from the proposed 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 proposed 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 proposed 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.

4.2 RECIEVING ENVIRONMENT

4.2.1 Habitats

The restoration works are proposed for the Former Quarry Subsite/Proposed Restoration Area which is a naturally calcareous site in various stages of recolonisation. The habitats present include: spoil heaps and stock piles of various materials (some of which are inert); exposed rock faces; spoil heaps of cobble, boulders and smaller inert aggregates; a small area of water that floods seasonally; hazel & gorse scrub; and a small groundwater fed area of ponding water with bulrush (*Typha latifolia*). It is worth mentioning that this groundwater fed area has the potential for Annex I habitat (Petrifying Springs with tufa formation (*Cratoneurion*) [7220]).The following habitat classifications (classification as per Fossitt guide to Habitats[13]) most closely resemble the habitats present:

- Hedgerows (WL1);
- Scrub (WS1);
- Spoil and bare Ground (ED2)/ Exposed Sand, Gravel and Till (ED1);
- Re-colonising Bare Ground (ED3);
- Calcareous Grassland (GS1); and
- Other Artificial Lakes and Ponds (FL8).

The proposed Asphalt Plant is to be located within the Proposed Asphalt Plant Subsite, which was the former quarry processing and dispatch yard in the northwestern corner of the site and is situated at the access road level. There is limited natural vegetation on the Proposed Asphalt Plant Subsite which is confined mainly to boundary areas. The following habitat classifications (classification as per Fossitt guide to Habitats[14]) most closely resemble the habitats present:

- Buildings and Artificial Surfaces (BL3);
- Spoil and bare Ground (ED2)/ Exposed Sand, Gravel and Till (ED1);

The principal habitat classes and their extents are presented on Figure 4 (with the exception of calcareous grassland, which occurred in narrow marginal strips) and described below.

4.2.1.1 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 *Crategus monogyna* and bramble *Rubus fruticosus agg*.

13 https://www.npws.ie/sites/default/files/publications/pdf/A%20Guide%20to%20Habitats%20in%20Ireland%20-%20Fossitt.pdf

14 https://www.npws.ie/sites/default/files/publications/pdf/A%20Guide%20to%20Habitats%20in%20Ireland%20-%20Fossitt.pdf

4.2.1.2 Scrub WS1

Dense hazel *Corylus avellana* scrub, a former coppice woodland, is located in the south east corner of the site over a ca. 1ha area. Other species established mainly around the periphery of this area between the hazel and tracks include blackthorn *Prunus spinosa*, bramble *Rubus fruticosus* agg., willow *Salix* spp. and burnet rose *Rosa pimpinellifolia*. Elsewhere gorse *Ulex europaeus* scrub occurs around the quarry boundaries and along the slopes of a quarry face/gully in the west of the site.

4.2.1.3 Calcareous Grassland GS1

Edging the scrub habitats at the side of tracks where exposed rocks have been colonised by vegetation are small strips/areas of calcareous grassland habitat which is typically found in areas with shallow rocky limestone soils (Fossitt, 2000). These species were recorded from the open ground around the access tracks and scrub margins. This habitat is characterised by harebell *Campanula rotundifolia*, yellow-wort *Blackstonia perforata*, quaking grass *Briza media*, wood sage *Teucrium scorodonia*, creeping cinquefoil *Potentilla reptans*, creeping bent *Agrostis stolonifera*, red fescue *Festuca rubra*, blue moor-grass *Sesleria caerula*, carline thistle, common sedge *Carex nigra* and the moss *Calliergonella cuspidata*. In areas with larger boulders/exposed rock the habitat grades to dry calcareous heath (HH2) forming a mosaic with GS1 habitat with juniper *Juniperus communis*, bird's-foot trefoil *Lotus uliginosus*, glaucous sedge *Carex flacca*, mouse-ear hawkweed *Pilosella officinarum*, creeping cinquefoil *Potentilla reptans*, *Carlina vulgaris* maidenhair spleenwort *Asplenium trichomanes,* bloody cranesbill *Geranium sanguineum*, and the mosses *Pseudoscleropodium purum* and *Ctenidium molluscum*.

4.2.1.4 Recolonising Bare Ground ED3

This habitat classification is used to describe the majority of the Former Quarry Subsite/Proposed restoration Area including Stockpile 1, Stockpile 8 and quarry floor (middle and upper benches) that show signs of recolonisation of plants. In these places common species include red clover *Trifolium pratense*, ribwort plantain *Plantago lanceolata*, yarrow *Achillea millefolium*, silverweed *Argentina anserina*, biting stonecrop *Sedum acre*, spear thistle *Cirsium vulgare*, common knapweed *Centaurea nigra*, common centaury *Centaurium erythraea*, smooth hawksbeard *Crepis capillaris*, wild carrot *Daucus carota* and rough hawkbit *Leontodon hispidus*.

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

This habitat classification is used to describe a large excavated steep-sided pit that is largely devoid of vegetation and inert stockpiles of processed or imported materials including cobbles and finer material (Stockpiles 3 - 7) within the Former Quarry Subsite/Proposed restoration Area. These stockpiles have not colonised in the 8 years since quarrying activities took place at the site. Vegetation is sparse and includes occasional coltsfoot (*Tussilago farfara)*, annual meadowgrass (*Poa annua)*, common centaury (*Centaurium erythraea)*, foxglove (*Digitalis purpurea)* and yellow-wort (*Blackstonia perforate)*. The habitat also extends over much of the former works area (i.e. Proposed Asphalt Plant Subsite).

4.2.1.6 Buildings and Artificial Surfaces BL3

This habitat is used to describe the existing site entrance, existing weighbridge, existing site office & associated car park, existing wheelwash, and existing concrete paving & walls, all within the Proposed Asphalt Plant Subsite, as shown on Figure 2. These areas are not of ecological value.

4.2.1.7 Other artificial lakes and ponds FL8;

This habitat classification is used to describe to lower bench of the quarry. This body of water is groundwater fed and is likely to dry during summer months. Broad-leaved pondweed (*Potamogeton natans*) was identified in this area during the site visit in October 2016.

A small portion of the middle bench is groundwater fed, creating ponds. This groundwater fed area has the potential for Annex I habitat (Petrifying Springs with tufa formation (*Cratoneurion*) [7220]).

4.2.2 Fauna

4.2.2.1 Mammals

Evidence of fox (scat and tracks) 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*); Stoat (*Mustela erminea*); and Hare (*Lepus timidus hibernicus*).

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 in the townland of Cregaclare Demense, ca. 2 km to the south of the site, and within Lough Fingall Complex SAC to the west of the site (source - NPWS data request - exact locations confidential). Lesser horseshoe bats are 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). An abandoned house/outbuilding, outside of the site but adjacent to the boundary, was identified as a potential roost for Lesser Horseshoe bat or other bat species. In addition, numerous crevices in the open quarry rock face provide opportunity for other bat species to roost, however as the quarry void and faces flood on an annual basis the potential for a sustainable roosting location is extremely low . The building was examined during the March and May 2015 Ecological Site Surveys and there was no evidence of any bat roost (e.g. bat droppings). The bat activity survey found no evidence of bats using the proposed development subsite or the wider Tonroe Quarry site.

4.2.2.2 Birds

Two Peregrine falcon (*Falco peregrinus*) were sighted flying over and around the Tonroe Quarry site on 12 December 2014. A single roosting Peregrine was recorded during the breeding bird survey on 20 March 2015. No nest site was located during this survey. There was no evidence of Peregrine or a nest site on the 12 May site visit but Peregrine was again present on site in October and November 2016. Peregrine are 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. However as the quarry void is intermittently flooded this may not provide a suitable nesting location.

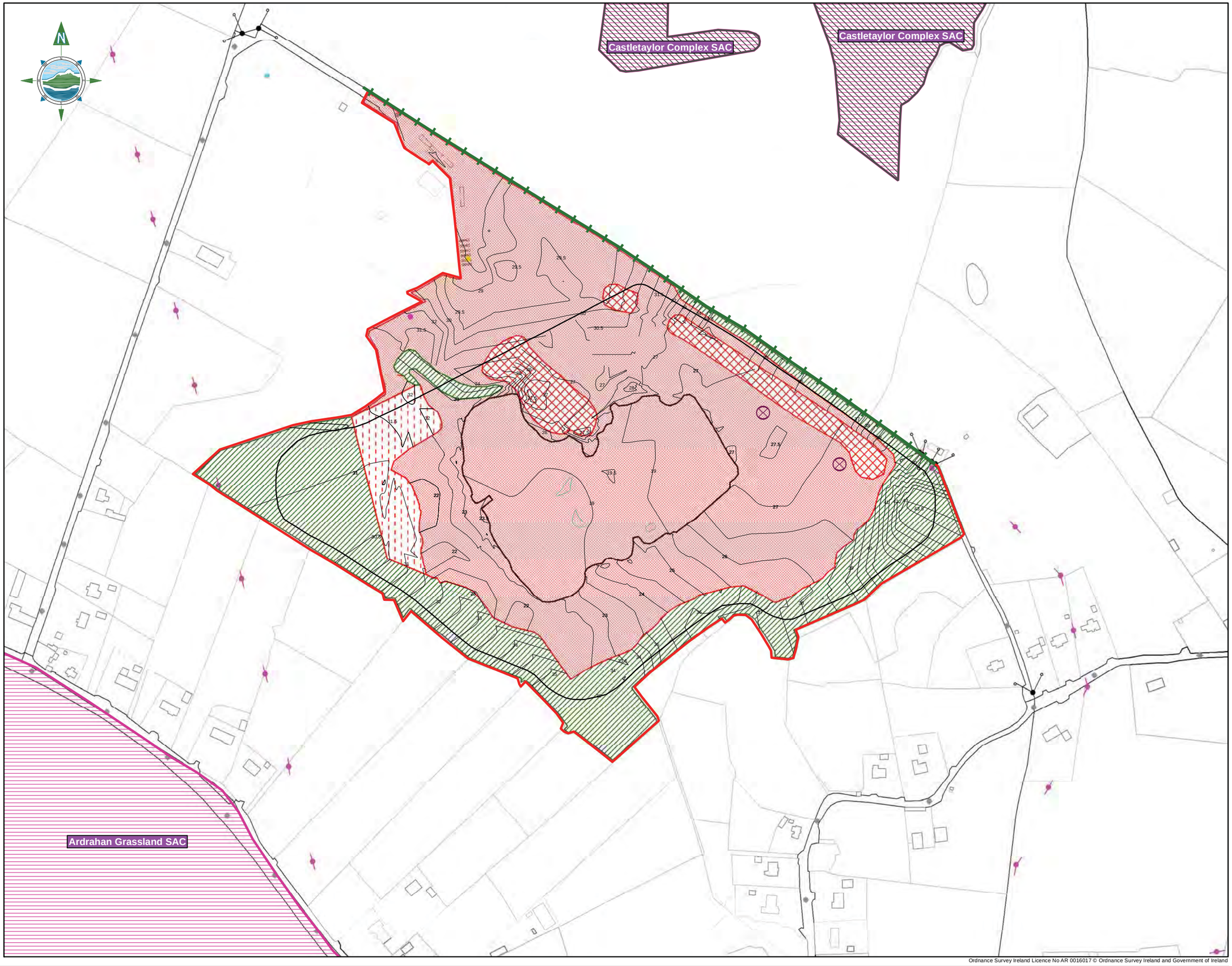
Sand martin nesting holes (inactive) were identified during the site surveys and are indicated on Figure 5-2, though this species was not confirmed as breeding in the March and May 2015 surveys, with the

holes remaining unoccupied. Sand martins are amber-listed species of moderate conservation concern. Kestrel are probable breeders with a foraging adult recorded on the site in May 2015. Other more common birds noted on site during the Ecological Field Surveys included:

- Wagtail;
- Blackbird;
- Hooded Crow;
- Willow warbler;
- Blue tit;
- Chiffchaff;
- Coal Tit;
- Wood Pigeon;
- Chaffinch;
- Wren; and
- Goldcrest.

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.

Figure 4: **Habitat Map**



Legend

- Study Area
- WL1 - Hedgerows
- ED1 - Exposed Sand,Gravel and Till
- ED2 - Spoil and bare ground
- ED3 - Recolonising bare ground
- WL1 - Scrub
- Special Area of Conservation
- Sand Martin

0 50 100
Meters

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	20.02.2017	NIS	F.H.	E.S

Client:

JOHN MADDEN & SONS LTD.

Project:

Tonroe Quarry
Development of Asphalt Plant and Restoration of Previously Quarried Area
NIS

Title:

HABITAT MAP

Scale @ A3: 1:3,500

Prepared by:	Checked:	Date:
F. Healy	E. Sweeney	February 2017

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Issue: A

Figure 4

4.2.3 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. The nearest surface water features are divided into 2 main areas.

The River Dunkellin which flows approximately 4 km to the north and north east of the site. Castlequarter/Caranavoodaun Turlough and Rahasane Turlough are associated surface water bodies located with the catchment. A number of interconnected turloughs discharge to the River Dunkellin and to the coast at Brandy harbour, namely: Fingal Turlough, Kiltiernan, Carraghdoo, Derreen and Tullynafrankagh Turlough.

To the south and south west surface water features are more limited. In the Coole-Kiltartan area, a series of interlinked turloughs, karst conduits and sinking streams/rivers drain the area, via the underground systems focused on Coole and Caherglassaun. Groundwater flow in the strata beneath Coole and Kiltartan is either in large open conduits (caves) within competent limestone or as diffuse flow within the rock fracture network. The nearest surface water features are Coole Lough, Coy Lough, Caherglassaun Turlough, Loughaunwee Turlough, Parkatleva Turlough and Owenbristy Turlough. Based on the water levels, groundwater can potentially flow towards both the Kiltiernan area and towards the Coole Lough Area. Based on previous studies of the surrounding area and onsite observations, the site is likely to exhibit a principal component of deep groundwater flow to the south/south east and minor component of shallow epikarst to the northwest during high water conditions. It is thought that the shallow component of groundwater flow is active in the upper flood stage in the Former Quarry Subsite/Proposed Restoration Area, when sufficient hydraulic head permits (22-24 mOD). The highest recorded level in recent years is 24.21 mOD. The flood study report indicates the 100 year and 1,000 year pluvial flood levels as 24.7 mOD and 25.2 mOD.

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 on the Dunkellin River approximately 6 km north of the Tonroe Quarry site boundary at Craughwell. Water quality on the Dunkellin is of Q3-4 and Q4 quality with the exception of the water quality to the 3 km east of Craughwell (Killian Br Station 0200).

Groundwater samples were taken from the flooded area of the Former Quarry Subsite/Proposed Restoration Area and from a groundwater well (GW6) in 2014. 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). Orthophosphate (<0.025 mg/l) and Nitrate (<8.9 mg/l as NO_3) concentrations were below their respective threshold values. All hydrocarbons were below detection limits. Suspended solids in the flooded quarry area and GW6 were low (<2 mg/l).

4.3 CHARACTERISATION OF EUROPEAN SITES POTENTIALLY AFFECTED

Full site synopses for the European sites under consideration are provided in Appendix F. 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.

4.3.1 Castletaylor Complex SAC

This site includes Caranavoodaun Turlough which lies ca. 1 km to the north of the Tonroe Quarry site. North of the turlough and to the south of the site there is a mosaic of other habitats including limestone pavement, dry calcareous grassland and heath. The eastern and much of the southern parts of the site are dominated by dry broadleaved woodland. Species present include Downy Birch *Betula pubescens*, Ash *Fraxinus excelsior*, Yew *Taxus baccata*, Hazel *Corylus avellana*, Holly *Ilex aquifolium* and Spindle *Euonymus europaeus*. The current overall conservation status (trend in brackets) of this sites qualifying interests are as follows:

- Turloughs [3180] Inadequate (stable);
- Alpine and Boreal heaths [4060] Bad (improving);
- *Juniperus communis* formations on heaths or calcareous grasslands [5130] Inadequate (stable);
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco Brometalia*)(*important orchid sites) [6210] Bad (stable);
- Limestone pavements [8240] Inadequate (stable).

4.3.2 Ardrahan Grasslands SAC

This site comprises a large flat limestone area with a mosaic of calcareous habitats including limestone pavement, alpine heath, juniper scrub and species rich grasslands. The limestone pavement is notable for the abundance of bearberry *Arctostaphylos uva-ursi* and juniper *Juniperus communis*. There is a small marl lake, Brackloon Lough, with associated fens and marshes in the south-west of the site. There are also two small turloughs within the site. The current overall conservation status (trend in brackets) of this sites qualifying interests are as follows:

- Alpine and Boreal heaths [4060] Bad (improving);
- Juniperus communis formations on heaths or calcareous grasslands [5130] Inadequate (stable);
- Limestone pavements [8240] Inadequate (stable).

4.3.3 Kiltiernan Turlough SAC

Kiltiernan Turlough lies in a linear depression running south-westwards from the main Galway-Limerick road, north-west of Ardrahan in Co. Galway. It has a flattish basin which lies approximately 2 m below road level, and includes about eight further depressions which are joined in times of high water. The site comprises a relatively dry turlough with a limited, though regular, flood in winter. The vegetation is mostly species-poor grassland and has been modified by trampling and over-grazing. In the less intensified eastern section of the site the Red Data Book species fen violet *Viola persicifolia* occurs.

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

- Turloughs [3180] Inadequate (stable).

4.3.4 Lough Fingall Complex SAC

This site comprises a complex of habitats dominated by turloughs and limestone pavement. The turloughs are oligotrophic and calcareous in character. The surface waters usually occupy distinct separate basins in most years but during extreme floods these can be linked together as one expanse of open water. Areas of limestone pavement, calcareous grassland, juniper scrub and lowland alpine heath also occur. The transitions and gradations between habitats, for example between turloughs, lakes and limestone pavement, gives rise to a range of physical conditions that favour many uncommon species. The site also supports an internationally important population of Lesser horseshoe bat.

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

- Lesser horseshoe bat (*Rhinolophus hipposideros*) [1303] Favourable;
- Turloughs [3180] Inadequate (stable);
- Alpine and Boreal heaths [4060] Bad (improving);
- Juniperus communis formations on heaths or calcareous grasslands [5130] Inadequate (stable);
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia)(*important orchid sites) [6210] Bad (stable);
- Calcareous fens with *Cladium mariscus* and species of the Caricion davallianae [7210] Bad (unknown);
- Limestone pavements [8240] Inadequate (stable).

4.3.5 Detailed Conservation Objectives

Detailed conservation objectives have not yet been developed for the sites under consideration however reference was made to those detailed objectives developed for Galway Bay Complex SAC (000268) for the following habitats:

- 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 *Cladium mariscus* and species of the *Caricion davallianae* [7210].

4.4 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.

All stormwater/ surface water run-off will be directed to the oil interceptor, settlement lagoon and percolation area located within the Proposed Asphalt Plant Subsite. The water required for the wheelwash will be recycled via an oil interceptor. Mitigation measures are detailed will be implemented to ensure that potential pollutants arising from surface water runoff and subsequent treatment within the Proposed Asphalt Plant Subsite or silt spread from stockpiles during the restoration of the Former Quarry Subsite/Proposed Restoration Area, do not reach groundwater. The implementation of these mitigation measures in full will ensure that no adverse effects will occur.

The proposed Asphalt Plant has the potential to create dust through material and machinery movement which may be transported offsite on the wheels of trucks or by wind. Deposited dust can impact negatively on flora and fauna. Smothering of vegetation by dust can interfere with photosynthesis and transpiration of plants and thus impact growth and seed rates. Dust can harm invertebrates indirectly by eliminating their habitat or food plans or by making them unavailable, and directly by being toxic or causing mechanical damage. Similarly, dust or sediments can impact on terrestrial and aquatic organisms. If not controlled, chronic infall of dust could have a long term negative impacts on qualifying interests of nearby SAC's.

It is noted that the activities on-site will be small in scale in comparison with previous quarrying operations at the site and vehicle movements will be correspondingly low. No further extraction from the Tonroe Quarry site is proposed. Furthermore, the roadways, parking areas and yard working areas will be paved with concrete or asphalt to minimise dust. Hardcore storage will be within the storage shed shown to minimise dust. By utilising dry-stored stone and sand, a lesser volume of fuel will be required to dry and heat the material for asphalt production, thus minimising both dust and exhaust emissions. The potential for the development to generate significant quantities of dust that would extend beyond the site boundaries is considered very low. It is noted in the DoEHLG (2004) Quarry guidelines that the most severe dust conditions are likely to be experienced within about 100 m of the dust source, with potential effects extending 0.5 km from the source.

The Asphalt Plant is a potential source of emissions to air including sulphur dioxide and nitrogen oxide which when produced at high levels can combine with water in the atmosphere to create 'acid rain'. The potential impacts of these emissions can include alteration of soil pH, disruption of photosynthesis and loss of sensitive species. The Asphalt Plant proposed will utilise best available technologies for reducing emissions and maintaining emissions below the Air Quality standards limit values. The Asphalt Plant will be licensed and emissions will be monitored to ensure that no exceedances occur. The production will be limited to 100,000 tonnes per annum which will be utilised for the proponents own contract work, which is largely on local authority and new road works.

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 with reference to bat populations within designated SAC sites, where the proposed development is located outside of the foraging range of any SAC designated as a Lesser horseshoe bat roost site. The lighting within the site will be turned off when the plant is inactive. The proposed development avoids potential disturbance effects on fauna in the local context, as there is no requirement for site activities such as blasting, crushing, and material screening.

4.4.1 Castletaylor Complex SAC

The turlough habitat is ca. 1 km from the Tonroe 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.

Groundwater flow has been identified as chiefly to the south of the site, away from the turlough habitat for which this site is designated. Occasional shallow groundwater flow westwards during high water conditions will also be away from this site. Any pollutants entering groundwater would not have the potential to affect the qualifying turlough habitat. Mitigation measures are detailed 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 boundary is in close proximity to the Tonroe Quarry site. The nearest habitat is broad-leaved woodland located ca. 100 m from the site boundary, and within the 500 m range where dust impacts are most likely to occur. It is noted that while this habitat is not listed as a qualifying interest of the site the tree canopy is open in places (viewed from aerial photography), and areas of the other habitats for which the site is designated are likely to occur within the woodland in a small-scale mosaic pattern.

Given the proposed production activity, with material storage within covered sheds, the potential for dust generation is considered to be low; however the close proximity of the site, and its location 'downwind' of prevailing south-westerly winds, requires stringent mitigation measures be put in place.

Once mitigation measures for controlling air and dust emissions detailed in Section 5 of this report are fully implemented, no significant adverse effects to the Annex I habitats for which the site is designated are anticipated.

4.4.2 Kiltiernan Turlough SAC

The turlough habitat is ca. 1.3 km from the Tonroe Quarry site boundary. Groundwater flow has been identified as chiefly to the south of the site, away from the turlough habitat for which this site is designated. Occasional shallow groundwater 'epikarst' flow north/westwards only has the potential to occur during high water conditions. Mitigation measures are detailed in Section 5 to ensure that potential pollutants arising from surface water runoff and subsequent treatment within the working area around the Asphalt Plant do not reach groundwater. The implementation of these mitigation measures in full will ensure that no adverse effects to the Annex I habitats of this site will occur.

4.4.3 Lough Fingall Complex SAC

The groundwater dependant wetland habitats are ca. 1.3 km from the Tonroe Quarry site boundary (turlough and caladium fen). There is no further excavation proposed within the Former Quarry Subsite/Proposed Restoration Area. Groundwater flow has been identified as chiefly to the south of the site, away from the wetland habitats for which this site is designated. Occasional shallow groundwater 'epikarst' flow north/ westwards only has the potential to occur during high water conditions. Mitigation measures are detailed in Section 5 to ensure that potential pollutants arising from surface water runoff and subsequent treatment within the Proposed Asphalt Plant Subsite or silt spread from stockpiles during the restoration of the Former Quarry Subsite/Proposed Restoration Area, do not reach

groundwater. The implementation of these 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 within this SAC is associated with Cloghballymore House, located approximately 6 km due west of the proposed 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[15]). 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 of this species should concentrate on such areas within 2.5 km of the nursery roost (Bontadina *et al.* 2001[16]). 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[17]). 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 Tonroe Quarry site or adjacent lands, it is concluded that there is no potential for significant adverse effects on Lesser horsehoe bats, in view of their conservation objectives. Mitigation measures related to site lighting are prescribed to avoid adverse effects to this Annex II species. In the long-term, this restoration plan could result in a beneficial impact to Lesser horseshoe bat and bat species in general, through the provision of foraging habitat.

4.5 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 Kiltiernan Lough and Lough Fingall complex to the northwest, and Ardrahan Grasslands and Castletaylor Complex to the southeast. This development will have a range of potential impacts to these sites during the construction and operational stages.

Once mitigation measures are fully applied for the proposed development at the Tonroe Quarry site, there are 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 will be confined to a local (site) level. One of the key concerns with regard to a major road scheme would be the potential for impacts to groundwater-dependant habitats in the vicinity of the development. As there will be no dewatering or impacts to groundwater levels from the proposed development at the Tonroe Quarry site, there is no potential for cumulative impacts to these protected habitats in this regard. Mitigation measures detailed below will avoid any potential cumulative groundwater pollution impacts.

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 proposed development site. The M17/M18 Motorway development comprises a gap in the commuting corridor for

[15] Schofield, H.W., 1996. The ecology and conservation biology of Rhinolophus hipposideros, the lesser horseshoe bat (Doctoral dissertation, University of Aberdeen).
[16] 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.
[17] 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.

this species in the vicinity of the proposed development; however, there is no synergistic or in-combination impact which could be attributed to the proposed development at the Tonroe Quarry site.

Cumulative impacts with former quarrying works at the Tonroe 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 restoration 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 dewatering or pumping occurred at the quarry site previously, neither is any proposed as part of the proposed development at the Tonroe Quarry site. The proposed 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.

5 MITIGATION MEASURES

5.1 WATER MANAGEMENT

John Madden & Sons Ltd. will endeavour to ensure 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 will be implemented at the site:

- The control and management of rainwater falling within the Proposed Asphalt Plant Subsite is vitally important in the protection of waters. Any surface water runoff from the Asphalt Plant and associated hardstanding areas will be directed through an oil interceptor and grit lagoon, prior to its discharge to an engineered percolation area, as detailed on Figure 2.2 of the PECR. The percolation area will be designed according to the design standards presented in CIRIA Report 156 (1996);
- All plant and machinery utilised on the site (within both the Former Quarry Subsite/Proposed Restoration Area during restoration and within the Proposed Asphalt Plant Subsite during its construction & operation) will be regularly maintained and checked regularly to ensure any damage or leakages are corrected;
- Refuelling and maintenance of vehicles will be undertaken at designated and approved concrete paved locations to ensure the risk to the water is minimised;
- Spill kits will be retained on site to ensure that all spillages or leakages are dealt with immediately and staff are trained in their proper use;
- All fuel will be stored in bunded tanks in bunded areas. No potentially polluting materials will be stored within the remaining Former Quarry Subsite/Proposed Restoration Area;
- All HGV vehicles exiting the site will be required to divert through a wheelwash located adjacent to the administration area. This infrastructure will ensure that vehicles do not cause soiling of roads. The wheelwash will be treated via a grit retention tank;
- A fully qualified Asphalt Plant Facility Manager will be employed to ensure compliance with relevant safety and statutory legislation and best practices recommended by the EPA, etc;
- Stockpiles spread during restoration works within the Former Quarry Subsite/Proposed Restoration Area will not be spread in vulnerable areas likely to be mobilised during periods of groundwater influx to the site.

There will be no dewatering or lowering of the watertable as a result of the proposed restoration works, or arising from the proposed Asphalt Plant. Therefore, there will be no anticipated adverse effect on groundwater levels, either inside or outside the property boundary of the Proposed Asphalt Plant Subsite. Monitoring of water within the existing quarry floor will be undertaken quarterly, when water is present. It is expected that this will provide three samples, as the groundwater table usually drops during the summer months. Monitoring and compliance will follow the requirements of any discharge licence stipulations. Water quality management will meet the following recommended guidance values:

- pH: <9;
- Biochemical Oxygen Demand: 25 mg/L;
- Total Suspended Solids: 35 mg/L;
- Nitrate: 50 mg/L
- Chemical Oxygen Demand: 100 mg/L

- Total Hydrocarbons: 100 mg/L

Water as stated will discharge to a percolation area, via an oil interceptor and a grit lagoon; this will have an invert level of the 1,000 year pluvial flood level, to allow for continuous dissipation of storm water to ground, as per original site drainage conditions.

5.2 AIR QUALITY MANAGEMENT

5.2.1 Fugitive Dust

John Madden & Sons Ltd. will endeavour to ensure that dust emissions from the Tonroe Quarry site (including the Former Quarry Subsite/Proposed Restoration Area, during restoration works and the Proposed Asphalt Plant Subsite, during construction & operation works) are kept to a minimum and will take all reasonable steps, as far as practical, to minimise dust emissions from the site.

Mitigation measures to be employed on the site to minimise dust emissions will include:

- Stockpiles of materials on the Former Quarry Subsite/Proposed Restoration Area (prior to or during removal to the Proposed Asphalt Plant Subsite for use) will be conditioned with water during periods of dry weather to minimise dust;
- Stockpiles of imported raw materials for use in the proposed Asphalt Plant will be stored in a manner as to minimise dust and to ensure that the product remains dry, so that less fuel will be required to be consumed in the Asphalt Plant production process, thus reducing the carbon emissions from the production process;
- All conveyors and plant (within Proposed Asphalt Plant Subsite) will be enclosed, where possible, to reduce dust emissions;
- The provision of on-site speed limits to prevent unnecessary generation of fugitive dust emissions;
- Provision of paved internal roadways (within Proposed Asphalt Plant Subsite) to prevent unnecessary generation of fugitive dust emissions;
- Access routes to be regularly inspected and cleaned when necessary;
- Heavy Goods Vehicles (HGV's) exiting the site will be diverted through an existing wheelwash. This will ensure that dust emissions are not generated from the tyres of vehicles exiting from the Tonroe Quarry site. It will also ensure that they do not carry excess soil and material onto the public road network;
- The provision of an on-site water bowser system to ensure that all internal hauls roads and access routes are sprayed with water in periods of dry weather to help suppress dust emissions;
- A complaints register will be maintained onsite and immediate action will be taken should any complaints be received regarding dust emissions;
- Dust monitoring will be carried out on a monthly basis at the Tonroe Quarry site at 5 No. locations. All dust monitoring records will be retained as part of the EMS system for the site.

5.2.2 Asphalt Plant

The principal type of dust collectors in the Asphalt Plant industry are baghouses. An inlet gas stream will pass through large bags made of plastics, artificial fibres or ceramics capable of withholding even

very fine particulate matter. The bags are cleaned when the dust layer on the bags becomes excessive, by blowing air through them in the opposite direction causing the particulate to fall down into the collection hopper to be returned to the asphalt production process or disposed of off-site.

Other mitigation measures to be employed within the proposed Asphalt Plant include:

- All fine materials will be kept in silos or in covered storage to minimise dust and to ensure that the product remains dry, so that less fuel will be required to be consumed in the Asphalt Plant production process, thus reducing the carbon emissions from the production process;
- Trucks delivering raw materials containing fines will have their loads covered;
- Filler storage silos will be equipped with a ventilation filter and a vent valve;
- Fuel with a low nitrogen and sulphur content will be used;
- The combustion process will be monitored on an ongoing basis, incorporating alarm systems to ensure it is as effective as possible.

The excess air level related to the combustion process is calculated on the basis of O2 or CO2 measurements. An appropriate level of excess air between 2 and 5.5 is considered best practice.

5.3 NOISE

Best practice mitigation measures for the control of noise will be employed at the Tonroe Quarry site during restoration works within the Former Quarry Subsite/Proposed Restoration Area and during the construction & operation of the Asphalt Plant, 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 will be within the daytime noise limits applicable for the site, the site operator will ensure the site is operated in the best practice manner in order to ensure that activities on site will be controlled as far as practicable. Best practice control measures will include:

- Items of plant and equipment used at the site will comply with the standards outlined in the *European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations, 1996;*
- Ensuring all plant items are maintained on a regular basis to ensure they are operating efficiently;
- Acoustic covers to engines should be kept closed when engines are in use or idling;
- All mobile equipment is throttled down or switched off when not in use;
- The movement of HGV's (for deliveries to and export of materials) on site is managed in an efficient manner;
- Design of internal haul roads with as low a gradient as possible so as to minimise excessive revving of vehicle engines travelling on-site;
- Regular maintenance of haul routes to avoid potholes and uneven surfaces;
- Use of rubber linings in chutes, dumpers, transfer points etc. to reduce the noise of rock falling on metal surfaces;

- Using simple baffles around washing drums, rubber mats around screening, crushing and coating plants;
- Enclosing pumps, covering conveyors, cladding the plant and keeping noise control hoods closed when machines are in use;
- Within the constraints of efficient production, limiting the use of particularly noisy plant, limiting the number of items in use at any one time, starting plants one-by-one and switching off when not in use;
- Avoiding unnecessary revving of engines, reducing speed of vehicle movement and keeping lorry tailgates closed where possible;
- Pointing directional noise away from sensitive areas where possible.

There is no requirement, neither is there any proposal for blasting, breaking or crushing of rock within the Proposed Restoration Area or within the Proposed Asphalt Plant Subsite.

5.4 REMEDIATION AND REPLANTING

The proposed restoration works for the Former Quarry Subsite/Proposed Restoration Area are described in full in the 'Proposed Restoration Plan For Previously Quarried Area', included in Appendix A. The restoration area will be monitored to assess the results of the proposed beneficial measures. Additional beneficial measures will be discussed with NPWS in relation to appropriate hibernation or roosting facilities at the restoration site.

5.5 LIGHTING

The lighting within the site will be turned off when the plant is inactive to avoid disturbance to foraging or commuting Lesser horseshoe bat. Security lighting and operational lighting during winter months will use low-pressure sodium lights instead of high-pressure sodium lights or mercury lamps. Lighting will be directional and avoid light spillage onto boundary habitats. The lighting plan will follow best practice guidelines as outlined in Stone (2013)[18].

[18] Stone, E.L. (2013) Bats and lighting: Overview of current evidence and mitigation.

6 DISCUSSION

The proposed restoration of the Former Quarry Subsite/Proposed Restoration Area and the development of the Asphalt Plant & associated works has been evaluated with regard to the designated Natura 2000 sites within the wider study area. Potential impacts affecting the Qualifying Interests of the Castletaylor Complex SAC, Kiltiernan Turlough SAC, and Lough Fingall Complex SAC have been evaluated, with specific reference to water quality impacts, dust, noise and lighting that have the potential to affect turlough habitats and the Annex II Lesser horseshoe bats. With the successful implementation of mitigation and monitoring measures described above, the proposed 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 will be 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 will be implemented. The parameters for compliance in terms of water quality management, as stipulated, will be achieved through ongoing monitoring during the works phase of the development. Operational stage water quality management will follow the existing, ongoing and 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 will be bound to incorporate these measures into the project proposal; effective implementation on site will ensure that there will be no significant effects, either individually or in combination with other plans or projects affecting the conservation interests or conservation objectives of the Castletaylor Complex SAC, Kiltiernan Turlough SAC, and Lough Fingall Complex SAC i.e. the integrity of these Natura 2000 sites. It is therefore concluded that the proposed development will not, beyond reasonable scientific doubt, adversely affect the integrity of any European Site (Natura 2000 site); whether directly, indirectly or cumulatively.

APPENDIX A

Proposed Restoration Plan For Previously Quarried Area

JOHN MADDEN & SONS LTD
Specialists in Tarmacadam & Synthetic Tracks

Tonroe Quarry,
Ardrahan, Co. Galway

Development of an Asphalt Plant & Associated Works, in Former Quarry Processing/Dispatch Yard Area and Completion of Restoration of Previously Quarried Area

Proposed Restoration Plan For Previously Quarried Area

March 2017

TOBIN CONSULTING ENGINEERS

TOBIN
Consulting Engineers

PROPOSED RESTORATION PLAN FOR PREVIOUSLY QUARRIED AREA

PROJECT:

Tonroe Quarry
Ardrahan, Co. Galway
Development of an Asphalt Plant & Associated Works, in Former Quarry Processing/Dispatch Yard Area
and
Completion of Restoration of Previously Quarried Area

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Client: John Madden & Sons Ltd.

Project: Tonroe Quarry, Ardrahan, Co. Galway
Development of an Asphalt Plant & Associated Works, in Former Quarry Processing/Dispatch Yard Area
and
Completion of Restoration of Previously Quarried Area

Title: Proposed Restoration Plan
For Previously Quarried Area

PROJECT NUMBER: 7625				DOCUMENT REF: 7625-04-01			
Rev A	Proposed Restoration Plan for Previously Quarried Area	JC	10/02/17	ESB/PC	29/02/17	JPK	08/03/17
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TOBIN Consulting Engineers							

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1 INTRODUCTION

TOBIN Consulting Engineers (TOBIN) were commissioned by John Madden & Sons Ltd. to produce a Proposed Restoration Plan for the previously quarried area at Tonroe Quarry, Ardrahan, Co. Galway.

The Tonroe Quarry site is set in a landscape of gently undulating limestone topography, dominated by agricultural grasslands, calcareous grasslands, juniper heath and woodland. Landholdings immediately adjacent are low-intensity agricultural grasslands and residential properties. There is a local/private road (L-85664) leading into the Tonroe Quarry site at its northwestern corner, which comes off the N18 National Galway to Ennis Road to the south. To the south of the N18 is a significant area of calcareous grassland (Ardrahan Grasslands Special Area of Conservation (SAC)), while ca. 100 m to the north of the site boundary is an area of dry broadleaved woodland (Castletaylor Complex SAC).

Tonroe Limestone Quarry was in operation between 1983 and 2009 under a number of different ownerships. It was last in operation between 2002 and 2009, under the ownership of Goode Concrete Ltd. and under Planning Permission (Galway Co. Co. Reg. Ref. 01/3587 / An Bord Pleanála Planning Ref. PL 07.129246). The Tonroe Quarry site was purchased by John Madden & Sons Ltd. in May 2014. The site is currently inactive (since 2009) and comprises a former quarry processing/dispatch yard area in the northwest of the site (i.e. 2.86 ha 'Proposed Asphalt Plant Subsite'), with an open excavated pit to the east of this area (i.e. 19.26 ha 'Former Quarry Subsite'), where completion of restoration is proposed. The 'Former Quarry Subsite' is to be fenced off and restored, allowing only infrequent access for ongoing monitoring of the environment and ecology.

2 MAIN OBJECTIVES

As stated above, extraction works at the quarry ceased in 2009. Since that time the site has undergone some natural recolonisation. Herein, TOBIN describes a Proposed Restoration Plan for the 19.26 ha previously quarried area (i.e. 'Former Quarry Subsite'), in line with the Wildlife, Habitats & the Extractive Industry: Guidelines for the Protection of Biodiversity within the Extractive Industry[1] and the recommendations of the Development Applications Unit[2]. The main objectives of this Proposed Restoration Plan are:

- Remove inert stockpiles for use in proposed Asphalt Plant from middle quarried benches;
- Spread stockpiles of suitable material thinly in select areas of the middle bench to promote colonisation of plants;
- Retain and augment existing boundary vegetation and planting;
- Secure and maintain the boundary walls and security fencing;
- Maintain the maintenance access track for maintenance of boundary walls, fences and planting;
- Allow nature to continue to naturalise the quarry pit floors and walls;
- Undertake no work in water or in the watertable layer to ensure that there will be no hydrological or hydrogeological impacts on the wider area or any of the designated sites therein;
- Erect fence and gate to close off the Former Quarry Subsite/Proposed Restoration Area from Proposed Asphalt Plant Subsite; and

[1] http://www.noticenature.ie/files/Notice%20Nature%20quarry%20brochure%20web_1.pdf
[2] Correspondence G Pre00340/ 2016 received 21 November 2016

- Ensure minimum interference to areas that have undergone natural recolonisation and restoration as possible, to include habituation of the site by Peregrine Falcon (*Falco peregrinus*) a Habitats Directive Annex I species.

It is hoped these measures will;

- Promote the regeneration of habitats previously supported at the site, namely: calcareous grassland, calcareous heath (with *Juniperus communis*, *Dryas octtopetala* and *Arctostaphylos uva-ursi*), limestone pavement, hazel scrub and hedgerows with Yew;
- Promote the regeneration of Habitats Directive Annex I habitats, previously supported at the site, namely: Semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (*important orchid sites) [6210] and European dry heaths [4020];
- Promote the regeneration of Habitats Directive Annex I habitats that may have previously been supported as fragments or mosaics at the site, namely: limestone pavement, Juniperus communis formations on heaths or calcareous grasslands and Alpine and Boreal heaths;
- Promote the formation of Habitats Directive Annex I habitats that may have the potential to occur, namely; Petrifying Springs with tufa formation (*Cratoneurion*) [7220].
- Provide additional substrate in select areas to promote colonisation of bare ground, whilst avoiding potential contamination of groundwater;
- Provide a site that is a unique and physically diverse habitat as refugia for birds, mammals and niche vegetation that grow on calcareous substrates.

3 METHODOLOGY

Previous ecological walkover surveys were completed on the site on the 8th of October 2014 and the 20th of March and 12th of May, 2015. These surveys included terrestrial habitats, flora and fauna surveys, including a daytime bat survey to determine roost potential and a night time bat activity survey. The most recent ecological walkover survey of the site was undertaken by an experienced TOBIN Ecologist on the 20 October 2016. This walkover included an assessment of the use of the site by mammals and an assessment of the physical diversity and habitats present on site. The timing of the visit was not appropriate to carry out a breeding bird survey; however the birds present on site at the time of the survey were noted. An experienced TOBIN Hydrogeologist, with a scientific background in determining potential water quality risk sources provided additional input to potential impacts affecting hydrology, hydrogeology and aquatic-dependant ecological receptors was also present on the 20 October 2016.

Two photographic surveys were also undertaken on site, on the 16 June 2016 and the 23 November 2016. These photographs are included in Appendix A.

The field surveys and photographic surveys carried out on site to date will provide baseline information for the evaluation of measures proposed within this Restoration Plan.

4 ECOLOGICAL WALKOVER FINDINGS

4.1 HABITATS

The 'Former Quarry Subsite' is a naturally calcareous site in various stages of recolonisation. The habitats present include: spoil heaps and stock piles of various materials (some of which are inert); exposed rock faces; spoil heaps of cobble, boulders and smaller inert aggregates; a small area of water

that floods seasonally; hazel & gorse scrub; and a small groundwater fed area of ponding water with bulrush (*Typha latifolia*). It is worth mentioning that this groundwater fed area has the potential for Annex I habitat (Petrifying Springs with tufa formation (*Cratoneurion*) [7220]).

The following habitat classifications (classification as per Fossitt guide to Habitats[3]) most closely resemble the habitats present:

Hedgerows (WL1):

The hedgerow habitats within the Former Quarry Subsite 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 (*Crategus monogyna*) and bramble (*Rubus fruticosus agg*).

Scrub (WS1):

The upper bench of the Former Quarry Subsite is dominated by dense hazel scrub. A former coppice woodland, is located in the south east corner of the Former Quarry Subsite over an area of approximately 1 ha. Other species established mainly around the periphery of this area between the hazel and tracks include blackthorn (*Prunus spinosa*), bramble, willow (*Salix spp.*) and burnet rose (*Rosa pimpinellifolia*). Elsewhere gorse scrub occurs around the quarry boundaries and along the slopes of a quarry face/gully in the west of the Former Quarry Subsite.

Calcareous Grassland (GS1):

Edging the scrub habitats at the side of tracks, where exposed rocks have been colonised by vegetation, are small strips/areas of calcareous grassland habitat which is typically found in areas with shallow rocky limestone soils (Fossitt, 2000). These species were recorded from the open ground around the access tracks and scrub margins. This habitat is characterised by harebell (*Campanula rotundifolia)*, yellow-wort (*Blackstonia perforate)*, quaking grass (*Briza media)*, wood sage (*Teucrium scorodonia)*, creeping cinquefoil (*Potentilla reptans)*, creeping bent (*Agrostis stolonifera)*, red fescue (*Festuca rubra)*, blue moor-grass (*Sesleria caerula)*, carline thistle (*Carline vulgaris*), common sedge (*Carex nigra)* and the moss (*Calliergonella cuspidate)*. In areas with larger boulders/exposed rock the habitat grades to dry calcareous heath (HH2) forming a mosaic with GS1 habitat with juniper (*Juniperus communis)*, bird's-foot trefoil (*Lotus uliginosus)*, glaucous sedge (*Carex flacca)*, mouse-ear hawkweed (*Pilosella officinarum)*, creeping cinquefoil (*Potentilla reptans)*, maidenhair spleenwort *(Asplenium Trichomanes),* bloody cranesbill (*Geranium sanguineum)*, and the mosses (*Pseudoscleropodium purum)* and (*Ctenidium molluscum)*.

Recolonising Bare Ground (ED3):

This habitat classification is used to describe the majority of the Former Quarry Subsite including Stockpile 1, Stockpile 8 and quarry floor (middle and upper benches) that show signs of recolonisation of plants. In these places common species include red clover *Trifolium pratense*, ribwort plantain *Plantago lanceolata*, yarrow *Achillea millefolium*, silverweed *Argentina anserina*, biting stonecrop *Sedum acre*, spear thistle *Cirsium vulgare*, common knapweed *Centaurea nigra*, common centaury

3 https://www.npws.ie/sites/default/files/publications/pdf/A%20Guide%20to%20Habitats%20in%20Ireland%20-%20Fossitt.pdf

Centaurium erythraea, smooth hawksbeard *Crepis capillaris*, wild carrot *Daucus carota* and rough hawkbit *Leontodon hispidus*.

Spoil and Bare Ground (ED2)/ Exposed Sand, Gravel and Till (ED1):

This habitat classification is used to describe a large excavated steep-sided pit that is largely devoid of vegetation, boulders and rock onsite (Plates 1 and 2 below) and inert stockpiles of processed or imported materials including cobbles and finer material (Stockpiles 3 - 7). These stockpiles have not colonised in the 8 years since quarrying activities took place at the site. Vegetation is sparse and includes occasional coltsfoot (*Tussilago farfara)*, annual meadowgrass (*Poa annua)*, common centaury (*Centaurium erythraea)*, foxglove (*Digitalis purpurea)* and yellow-wort (*Blackstonia perforate)*.

Plate 1: Boulders and rock on site. Photograph taken November 2016.

Plate 2: Boulders and rock on site. Photograph taken November 2016

Other Artificial Lakes and Ponds (FL8):

This habitat classification is used to describe to lower bench of the quarry. This body of water is groundwater fed and is likely to dry during summer months. Broad-leaved pondweed (*Potamogeton natans*) was identified in this area during the site visit in October 2016 (see Plate 3 below).

Plate 3: Broadleaved pondweed. Photograph taken October 2016

A small portion of the middle bench is groundwater fed, creating ponds (see Plates 4 and 5 below). This groundwater fed area has the potential for Annex I habitat (Petrifying Springs with tufa formation (*Cratoneurion*) [7220]).

Plate 4: Groundwater fed pond on the middle shelf. Photograph taken November 2016.

Plate 5: Groundwater fed pond on the middle shelf. Photograph taken November 2016.

4.2 FLORA

The inactive Former Quarry Subsite is calcareous in nature. The upper bench of the quarry is dominated by scrub of hazel, gorse and bramble.

Also present on the upper bench are areas of disturbed ground and gravel, some of which form part of the access track around the upper bench. These areas were colonising by calcareous species such as Carline Thistle and Yellow-wort (see Plates 6 and 7 below). It is proposed that this access track will be visited periodically by a tracked machine in order to keep the track accessible for ongoing monitoring of the water quality at the site. This ongoing moderate level of disturbance will ensure that growth of 'disturbed ground' species such as these will prevail and not be out competed by gorse.

Plate 6: Yellow-wort on site

Plate 7: Carline thistle on site

4.3 MAMMALS

No evidence of mammals was identified on site during the Ecological Walkover Survey on the 20th of October 2016. Evidence of fox (scat and tracks) was observed during the Ecological Field Surveys in 2015. 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*); Stoat (*Mustela erminea*); and Hare (*Lepus timidus hibernicus*).

4.4 BATS

Lesser Horseshoe Bat roosts exist at a number of sites in the region, the closest being in the townland of Cregaclare Demense, ca 2 km to the south of the site, and within Lough Fingall Complex SAC to the west of the site (source - NPWS data request - exact locations confidential). Lesser horseshoe bat are 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).

An abandoned house/outbuilding, outside of the site but adjacent to the boundary, was identified as a potential roost for Lesser Horseshoe bat or other bat species. In addition, numerous crevices in the open quarry rock face provide opportunity for other bat species to roost. The building was examined during a daytime bat roost potential survey in May 2015 and there was no evidence of any bat roost (e.g. bat droppings). A bat activity survey, also carried out in May 2015, found no evidence of bats using the Tonroe Quarry site.

4.5 BIRDS

Two Peregrine falcons (*Falco peregrinus*) were sighted flying over and around the Tonroe Quarry Site on 12 December 2014. A single roosting Peregrine was recorded during the breeding bird survey on 20 March 2015. No nest site was located during this survey. There was no evidence of Peregrine or a nest site on the 12 May site visit in 2015. A Peregrine falcon was again recorded on site on the 20 October 2016, feeding on a blackbird on the upper bench of the quarry, along the exposed eastern rock face

(see Plate 8 below). A peregrine was again photographed on site during a photographic survey on the 23 November 2016.

The inactive Former Quarry Subsite provides perfect habitat for this species.

- 

Plate 8: Peregrine falcon. Photograph taken 20 October 2016

Sand martin nesting holes (inactive) were identified during the site surveys, though this species was not confirmed as breeding in the March and May 2015 surveys, with the holes remaining unoccupied. Sand martin are amber-listed species of moderate conservation concern.

Kestrel are probable breeders with a foraging adult recorded on the site in May 2015.

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

- Wagtail;
- Blackbird;
- Hooded Crow;
- Willow warbler;
- Blue tit;
- Chiffchaff;
- Coal Tit;
- Wood Pigeon;
- Chaffinch;
- Wren; and
- Goldcrest.

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.

4.6 AQUATIC FLORA & FAUNA

On the 20th of October 2016, broadleaved pondweed was identified within the lower bench of the quarry.

4.7 SUMMARY OF ECOLOGICAL WALKOVER SURVEY

In its current state, the Former Quarry Subsite offers physical diversity, in line with that described within 'Wildlife, Habitats & the Extractive Industry: Guidelines for the Protection of Biodiversity within the Extractive Industry1', through standing water, scrub, benches in rock, cliff faces, rough topography and rubble, all of which provide a variety of habitats.

With minimal works, the Former Quarry Subsite offers a unique opportunity to provide natural, local calcareous habitat, in line with the original habitats at the site, and refugia for fauna such as Peregrine Falcon that are already utilising the site.

The main issues identified with the site in its current state are some of the stockpiles left on the site.

There are stockpiles of material on site that are recolonising, but at a very slow pace, namely Stockpile 1 and Stockpile 8 (see Plate 9 and Plate 16 in Appendix A respectively). These stockpiles are currently in heaps with large slopes. It is possible that these slopes are unstable and material may be mobilising in periods of wet or windy weather.

Inert stockpiles are present on site that have not colonised in the 8 years since operations have ceased, namely Stockpiles 3 - 7 (see Plates 11 to 15 in Appendix A respectively).

Three additional Photographic Locations, namely Locations 2, 17 and 20, were identified as potentially benefitting from an additional thin layer of overburden to promote growth (see plates 10, 32 and 37 in Appendix A respectively).

The locations and numbering of all stockpiles are outlined on Figures 1 and 2. Figure 3 shows photograph locations and directions for Plates 9 – 43, which are attached in Appendix A.

Figure 1: Existing Site Layout Showing Stockpiles, Fences & Tracks

Proposed Asphalt Plant Sub-site (2.86ha)

Former Quarry Sub-site/Proposed Restoration Area (19.26ha)

"Original" Quarry

Ground Water Cascade

TONROE

Legend

- Application Boundary
- Land Ownership Boundary
- Retain and Augment Existing Indigenous Vegetation and Planting
- Existing Security Fence
- Proposed Security Fence
- Upper Quarry Face
- Lower Quarry Face
- Access for Maintenance of Fence & Planting
- Existing Stockpiles & Stockpile No. (1-23)
- Ponds on Middle Bench (A)

NOTES:

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5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chkd.
A	09/02/2017	Restoration Plan	MK	BR

Client: JOHN MADDEN & SONS LTD.

Project: Tonroe Quarry, Development of Asphalt Plant and Restoration of Previously Quarried Area PROPOSED RESTORATION PLAN

Title: Existing Site Layout Plan Showing Stockpiles, Fences & Tracks

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

Prepared by:	Checked	Date:
MK	BR	Feb 2017

Project Director: John P. Kelly

Drawing Status: PLANNING

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Drawing No.: Figure 1

Revision: A

Figure 2: Existing Aerial Site Layout Plan Showing Stockpiles, Fences, Tracks and Planting

Legend

- Application Boundary
- Land Ownership Boundary
- Existing Security Fence
- Proposed Security Fence
- Upper Quarry Face
- Lower Quarry Face
- Access for Maintenance of Fence & Planting
- Existing Stockpiles & Stockpile No. (1-23)

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Drawing No.: Figure 2

Revision: A

5 PROPOSED RESTORATION PLAN

This section should be read in conjunction with Figure 3 and Figure 4. In each case throughout this section, stockpile numbers quoted refer to 'Existing Stockpiles 1-23' as indicated on Figure 3 and Photograph Location numbers refer to those shown by arrows on Figure 3.

Inert stockpiles of processed or imported materials are present on the Former Quarry Subsite that have not colonised in the 8 years since quarrying operations have ceased, namely Stockpiles 3 - 7 (see Plates 11 to 15 in Appendix A respectively). The Former Quarry Subsite would benefit from the removal of Stockpiles 3 - 7 and their placement within the Asphalt Plant Subsite, for use in the development of the Asphalt Plant and associated works. Use of these materials within the overall site is not considered quarrying activity.

It should be noted that sand martin nesting holes (inactive) were identified during previous site surveys in the vicinity of Stockpiles 5 and 6.This species was not confirmed as breeding in the March or May 2015, with the holes remaining unoccupied. Sand martin is an amber-listed species of moderate conservation concern. This species makes use of these temporary habitats and impacts have the potential to be significant if stockpiles with active nesting holes are disturbed during the breeding season. A small portion of Stockpiled material will be retained at the quarry's northern rock face (existing location), and stabilised to improve its capacity to support breeding Sand martin in the future. Mitigation with respect to timing of any historic stockpile removals is recommended (i.e. any stockpiles containing active Sand martin nesting holes will be left undisturbed during the breeding season (01 March – 31 August, inclusive).

Following removal of Stockpiles 3 - 7, it is proposed that Stockpile 1 and Stockpile 8 (see Plate 9 and Plate 16 in Appendix A respectively), which are recolonising at a slow pace, would then be spread out thinly over the footprint area from which Stockpiles 3 - 7 were removed. In line with the recommendations of the Guidelines for the Protection of Biodiversity within the Extractive Industry1, it is hoped that this measure would "aid rooting for plants" in the areas previously occupied by Stockpiles 3 - 7. In addition, the spreading of Stockpiles 1 and 8 would remove the current situation of unstable sloped heaps of spoil on site and ensure that Stockpiles 1 and 8 are "stable in periods of wet weather". Stockpiles 1 and 8 consist of material suitable for spreading on site and are currently colonising by calcareous flora. The use of this material in the restoration of the quarry is therefore also in keeping with the guidelines11. No material is to be imported. Only existing materials already on site will be used to enhance flora recovery.

Stockpile 11 is currently in an exposed location and is therefore not colonising (see Plate 23 in Appendix A). This stockpile would benefit from being moved to the foot of the quarry faces and overlaid with material from Stockpile 1, to promote growth.

The influx of groundwater from a spring in the south of the Former Quarry Subsite necessitates careful management of the movement of silt and aggregate for restoration purposes in the location. Groundwater flows on to southern sections of the middle bench in winter, causing ponding. It is worth mentioning that this groundwater fed area has the potential for Annex I habitat (Petrifying Springs with tufa formation (*Cratoneurion*) [7220]). The ponded water in this area also likely reaches the lower bench during periods of flood. The lower bench is linked to the groundwater table. For this reason, proposed spreading of materials to promote growth on the middle bench has been limited to three locations,

removed from the ponded area, namely Photograph Locations 2, 17 and 20 (see plates 10, 32 and 37 in Appendix A). A thin layer of material, taken from Stockpile 1, will be spread at Photograph Locations 2, 17 and 20, staying sufficiently removed from areas likely to flood on the middle bench in order to prevent the contamination of groundwater with silt. No materials, site won or otherwise, are to be placed in the lower bench of the site, as to do so may impact on the karst aquifer.

It is proposed that minimal augmentation to the hazel scrub and hedgerows in the upper bench be carried out. Supplementary planting of native hazel will be carried out to bolster hedgerows and scrub. This will increase visual screening of the site and provide encouragement of re-growth of the original coppice woodland.

No roosting bats or bat activity were recorded on site during the May 2015 surveys. Although the quarry face provides crevices that may be suitable, it is proposed that two bat boxes are attached to telegraph poles along the north upper bench, at a height of at least 4 m. These bat boxes will be optimally placed along the linear hedgerow to the north of the site, which is south facing. The former quarry already provides suitable foraging habitat and the lower bench provides access to water. The addition of bat boxes will further enhance the usefulness of the site for bats. The provision of these bat boxes is in line with guidance from The Bat Conservation Trust[4].

The removal of the stockpiles of processed stone from the middle and upper quarried benches and its transport to the Asphalt Plant Subsite for use will be carried out using 2 no. 30 tonne dump trucks and 2 no. backhoe excavators. Mitigation measures to protect the site from potential impacts in relation to these works are included in the Planning and Environmental Considerations Report (PECR), included with this Planning Application. This includes a recommendation for all works to take place outside of the bird breeding season (1 March to 31 August).

The Proposed Restoration Plan works will be commenced/undertaken within 12 months of grant of planning and prior to commissioning of the Asphalt Plant. A schedule of works for the Proposed Restoration Plan will be produced and agreed with the NPWS prior to the commencement of works to ensure that the timing is favourable ecologically.

Given the excellent diversity of physical habitats present on site, it is proposed that all other areas will be left to continue to colonise naturally.

[4] http://www.bats.org.uk/pages/bat_boxes.html

Figure 3: Existing Site Layout Plan Showing Photograph Locations and Directions

Proposed Asphalt Plant Sub-site (2.86ha)

Former Quarry Sub-site/Proposed Restoration Area (19.26ha)

Ground Water Cascade

TONROE

Legend

- Application Boundary
- Land Ownership Boundary
- Retain and Augment Existing Indigenous Vegetation and Planting
- Existing Security Fence
- Proposed Security Fence
- Upper Quarry Face
- Lower Quarry Face
- Access for Maintenance of Fence & Planting
- Stockpile to be removed to Asphalt Plant
- Stockpile to be Spread/Retained in Situ
- Location & Direction of Photograph (9)
- Existing Stockpiles & Stockpile No. (1-23)
- Ponds on Middle Bench (A)

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Drawing No.: Figure 3

Revision: A

Figure 4: Proposed Restoration Plan For Previously Quarried Area

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Realignment of Existing Fence

Proposed Asphalt Plant Sub-site (2.86ha)

Former Quarry Sub-site/Proposed Restoration Area (19.26ha)

Original Quarry

To Remain Untouched (Floods in Winter)

Ground Water Cascade

TONROE

Legend

- Application Boundary
- Land Ownership Boundary
- Retain and Augment Existing Indigenous Vegetation and Planting
- Existing Security Fence
- Proposed Security Fence
- Upper Quarry Face
- Lower Quarry Face
- Access for Maintenance of Fence & Planting
- Revised Access for Maintenance
- Pockets of Spoil to be Banked against Rock Face
- Vacated Areas over which Stockpile 8 Spread
- Vacated Areas over which Stockpile 1 Spread
- Upper natural scrub land regeneration to be allowed continue
- Existing gravel plants to be allowed continue develop
- Existing Safety Berm to be retained
- Existing Pond
- Existing Stockpiles to Remain and Vegetate Naturally

Rev.	Date	Description	By	Chkd.
A	09/02/2017	Restoration Plan	MK	BR

Client: JOHN MADDEN AND SONS LTD.

Project: Tonroe Quarry, Development of Asphalt Plant and Restoration of Previously Quarried Area PROPOSED RESTORATION PLAN

Title: Proposed Restoration Plan For Previously Quarried Area

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6 MONITORING

In line with recommendations included in the PECR, precautionary monitoring is proposed for breeding birds, to be implemented in March/April prior to the commencement of the Restoration Works. This survey will confirm bird breeding status and nest locations of Peregrine falcon and Sand martin within the Former Quarry Subsite. This information will be taken into account in planning the operational practices (i.e. restoration works) around the nesting season (i.e. egg/hatching stage - late March until the end of May; and as the chicks get bigger - end of May until the end of July). This monitoring will be conducted by an experienced ecologist so as to ensure that Peregrine or active Sand martin nests are not impacted by the proposed restoration works.

With the exception of visual surveys of macrophytes, no aquatic flora or fauna surveys have been carried out on site to date. Following feedback from the DAH and Julie Fossitt of the NPWS, it is proposed to carry out a survey to assess aquatic macrophyte, charopyhte and macroinvertebrate communities in summer of 2018, prior to the commencement of Restoration works, when water levels should be sufficiently low to sample. In accordance with guidance published by Natural England[5], it is proposed to identify macrophytes and charopyhtes from the shore, if possible. Should non-destructive methods be unsuccessful, Grapnel samples will be taken to identify macrophytes and charophytes, if present,

If access to the lower bench is possible, timed hand searches for macroinvertebrates will be carried out and a Q-Value of the water body be awarded. Due to the direct links of the water body to the karst groundwater aquifer, kick sampling at this location is not proposed to avoid possible contamination of the groundwater aquifer with sediments.

It is proposed that the results of the aquatic flora and fauna surveys in 2018 will be used as baseline to measure the success of the Restoration Plan in future. Photographs of the water body will be taken at a set location that can be re-visited during future monitoring events to map the progress of colonisation by aquatic flora.

It is recognised that the success of any management plan depends on an effective monitoring strategy and adapting measures where necessary.

Surveys of the Former Quarry Subsite will be carried out in years 1, 2 and 5 post restoration works. This schedule of ongoing monitoring is based on the National Roads Authority guidance[6] , which recommends monitoring for up to one year post construction. These surveys will include:

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https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/349230/aquatic_plants_sampling.pdf

[6] National Roads Authority (2006) Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Roads Scheme. Dublin: National Roads Authority

Water Quality Monitoring:

In line with the recommendations of the Natura Impact Statement accompanying this Planning Application, water retained within the lower bench of the quarry will be sampled and analysed quarterly, if present (no sample may be available in summer if the water level is insufficiently low).

Ornithological Survey:

One transect survey of the Former Quarry Subsite will be carried out between April 1st and June 30th. The Line Transect methodology will follow Gregory et al (2004)[7]. All bird species present will be identified, through sight and audible call, and recorded. The aim of this survey will be to determine the use of the site by all bird species and also determine the occupancy of the site by Peregrine and Sand martin. Subsequent visits in the same breeding season may be required if the continued presence of Peregrine on site cannot be determined during the first visit.

Mammal Survey:

A mammal walkover survey will be carried out by an experienced ecologist, ideally between February and May, to search for evidence of use of the site by mammals such as fox, badger, stoat, hare etc., for breeding or foraging purposes.

Bat Survey:

A day time bat survey will be carried out once between June and September to determine if bat boxes provided, or crevices on site, are being utilised by roosting bats. A follow up bat activity survey (dusk) will be carried out to determine the numbers (if possible) and species utilising the site, should evidence of roosting be observed (staining, food debris etc.)

Vegetation and Habitat Monitoring:

A site visit will be made between April and September, to confirm that the removal of selected Stockpiles and the spreading of stockpile material has promoted growth and recolonisation as anticipated. This survey will confirm that no alien invasive species have colonised the site.

During each visit, a habitat survey will be carried out to monitor the development and expansion of habitats such as wetlands, calcareous grassland and hazel scrub and map any Annex I Habitats, if present.

Fixed Point Photographic Survey

A fixed point photograph survey will be undertaken during each visit in year 1, 2 and 5, which will allow comparison of habitat development from year to year.

The monitoring of progress on site will allow for adaption of measures where necessary.

7 CONCLUSIONS

The Proposed Restoration Plan for the Former Quarry Subsite at Tonroe Quarry provides a unique opportunity to provide a refugia for flora and fauna native to the calcareous region. This Proposed Restoration Plan was developed with reference to Wildlife, Habitats & the Extractive Industry: Guidelines for the Protection of Biodiversity within the Extractive Industry1'. The objectives of the

[7] http://www.ebcc.info/wpimages/other/birdsurvey.pdf

Restoration Plan set out to promote natural local flora and fauna that were originally onsite, prior to quarrying works, to continue to colonise the site, with minimal intervention or disturbance to the natural recolonisation that has already taken place at the site.