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INTRODUCTION

Background

4.1 This chapter presents an Ecological Impact Assessment (EcIA), conducted by SLR Consulting Ireland (SLR), to inform the wider Environmental Impact Assessment (EIA) process and production of an Environmental Impact Statement (EIS), to accompany the planning application by Roadstone Limited for the development and operation of an inert waste recovery facility to facilitate the restoration of an existing quarry void by backfilling using imported soil and stone waste at Calary Quarry, Kilmacanogue, Co. Wicklow and re-establishing a heathland / grassland habitat, similar to that which originally existed prior to quarrying,

Location and Setting

4.2 Calary Quarry is located on the lower western slope of the Great Sugar Loaf Mountain in the townlands of Killough Upper and Glencap Commons North, approximately 2.3km south-west of the village Kimacanogue and 4.4km south of Enniskerry, Co. Wicklow, as shown on Figure 4.1.

4.3 The application site for the proposed development of an inert soil waste recovery facility to allow for the backfilling and restoration of the quarry void covers 9.1 hectares (ha) out of a total landholding of 25.45ha. The application site comprises a deep steep-sided quarry void that, since the cessation of dewatering operations in 2010, has gradually become flooded.

4.4 The surrounding landscape is characterised by the Great Sugar Loaf Mountain, an outcrop of rock rising to 501mAOD, to the east of the application site and the Wicklow Mountains to the west which are separated by the steep-sided river valleys of the Killough and Dargle Rivers. The mountain areas typically comprise open heathland / upland grassland mosaics whilst the river valleys comprise farmland predominantly under permanent pasture interspersed by blocks of semi-natural broadleaved woodland, coniferous plantation woodland and scrub on the steeper valley slopes. Small rural settlements and properties are scattered along the public roads and rural lanes which traverse the local landscape.

Purpose of the Ecological Impact Assessment

4.5 The EcIA can be considered as having three main purposes:

- to provide an objective and transparent assessment of the ecological effects of a proposed development or activity;
- to permit objective and transparent determination of the consequences of the proposals in terms of national, regional and local policies relevant to nature conservation; and
- to demonstrate that a proposed development or activity will meet legal requirements relating to habitats and species.

4.6 This EcIA has been undertaken in accordance with the Environmental Protection Agency's (EPA) guidelines[1],[2] and guidelines published by the Chartered Institute of Ecology and Environmental Management (CIEEM)[3], '*the IEEM Guidelines'*, and follows a standard approach based upon the description of the existing baseline conditions within the application site at Calary Quarry; an evaluation of the habitats and species present within the application site; the identification of potential ecological effects of the proposed backfilling of the existing quarry void using imported inert soil and stone and its restoration to a heathland / grassland habitat and an assessment of the likely significance of identified impacts on valued ecological receptors (VERs), both within the application site and within the zone of influence of the proposed development.

4.7 Where a significant negative impact has been identified suitable mitigation, enhancement and/or compensatory measures to prevent, reduce or offset the level of impact are provided with any residual effects, following the implementation of mitigation and enhancement measures, identified and assessed.

LEGISLATIVE AND POLICY CONTEXT

4.8 This section summarises key legislation and national, regional and local policies relevant to ecology and nature conservation.

Legislative Context

4.9 The key wildlife legislation underpinning the conservation of habitats and species are summarised below.

The Wildlife Act 1976 and Wildlife (Amendment) Act 2000

4.10 The Wildlife Act is the primary legislation in Ireland which extends legal protection to animals, birds, plants and their habitats. It provides for the designation of Natural Heritage Areas (NHA) and statutory Nature Reserves and the regulation of hunting and controls in wildlife trading.

The Flora (Protection) Order 1999

4.11 The Flora (Protection) Order 1999 provides statutory protection to a number of rare plant species in Ireland from being wilfully cut, picked uprooted or damaged or part of the plants removed.

European Communities (Birds and Natural Habitats) Regulations 2011

4.12 The European Communities (Birds and Natural Habitats) Regulations 2011 transpose European Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive) and 2009/147/EC on the Conservation of Wild Birds (The Birds Directive) into national law and provides for the designation and protection of 'European sites' including Special Areas of Conservation (SAC) and Special Protection Area

[1] Environmental Protection Agency (2002). *Guidelines on the Information to be Contained in Environmental Impact Statements*. Environmental Protection Agency, Dublin.
[2] Environmental Protection Agency (2003). *Advice Notes on Current Practice (in the Preparation of Environmental Impact Statements)*. Environmental Protection Agency, Dublin.
[3] Institute of Ecology and Environmental Management (2006). *Guidelines for Ecological Impact Assessment in the United Kingdom*.

(SPA), the protection of 'European Protected Species', and the adaptation of planning and other controls for the protection of European Sites. The regulations also introduce a review procedure for plans and projects likely to significantly affect a European site, and licensing requirements for developments that may affect a European protected species.

Planning Policies

National

4.13 Nationally, the Government's commitment to sustainable development is set out in a number of documents including the National Development Plan 2007-2013, National Spatial Strategy 2002-2020 and the Sustainable Development: A Strategy for Ireland 1997.

Regional

4.14 The Regional Planning Guidelines for the Greater Dublin Area (GDA) 2010-2022 sets out the long-term spatial planning strategy for the GDA. The strategic policies relevant to ecology and nature conservation within these guidelines are summarised in Table 4.1.

Table 4.1
Regional Policies Relevant to Ecology and Nature Conservation

Policy Reference	Policy
Natural Heritage - GIP2	To protect and conserve the natural environment, in particular nationally important and EU designated sites such as SPA, candidate SAC and proposed NHAs, protected habitats and species, and habitats and species of local biodiversity value. This policy also includes new or extended ecological sites that are notified or designated in the lifetime of the RPGs. Appropriate measure to protect Natura 2000 sites should be identified at the initial stages of all planning processes and included as a material consideration in order to inform future development.
River Basins - GIP3	To ensure alignment between the core objectives of the Water Framework Directive, (including River Basin Management Plans and Programmes of Measures affecting the Greater Dublin Area) and other related plans such as County Development Plans and related Local Area Plans; Habitat and Species Protection Plans under the Habitats Directive, Water Services Investment Programme, Nitrates Action Programme; and Flood Management Plans.
Green Infrastructure – GIP6	To ensure the protection, enhancement and maintenance of the natural environment and recognize the health benefits as well as the economic, social, environmental and physical value of green spaces through the development of an integration of Green Infrastructure (GI) planning and development in the planning process.

Local

4.15 Planning policy at the local level is provided by the Wicklow County Development Plan 2010-2016 adopted on 4th October 2010. This plan contains a number of policies relevant to ecology and nature conservation that are summarised in Table 4.2.

Table 4.2
Local Policies Relevant to Ecology and Nature Conservation

Policy Reference	Policy
Biodiversity	
BD2	To ensure that the impact of new developments on bio-diversity is minimised and require measures for the protection and enhancement of bio-diversity in all proposals for large developments.
BD3	To maintain the favourable conservation status of existing and future Natura 2000 sites (SACs and SPA's) and Annex I-Habitats and Annex II-Animal and Plant species in the County.
BD4	Any programme, plan or project carried out on foot of this development plan, including any variation thereof, with the potential to impact upon a Natura 2000 site(s) shall be subject to an Appropriate Assessment in accordance with Article 6(3) of the EU Habitats Directive 1992 and "Appropriate Assessment of plans and projects in Ireland-Guidance for Planning Authorities" (DoEHLG 2009).
BD5	To maintain the conservation value of all proposed and future Natural Heritage Areas (NHAs) in Wicklow.
BD6	The Council recognises the natural heritage and amenity value of the Wicklow Mountains National Park and shall consult at all times with National Park management regarding any developments likely to impact upon the conservation value of the park, or on issues regarding visitor areas.
BD7	To protect non-designated sites from inappropriate development, where it is considered that such development would unduly impact on locally important natural habitats or wildlife corridors.
Woodlands, Trees and Hedgerows	
WH1	To promote the protection of trees, in particular native species, and those associated with demesne planting, which are of conservation and/or amenity value as set out in Volume 2 of the Plan
WH2	To consider the making of Tree Preservation Orders (TPOs) to protect trees of high value, where it appears that they are in danger of being felled.
WH3	Development that requires the felling of mature trees of conservation and/or amenity value, even though they may not be listed in the Development Plan, will be discouraged.
WH4	To discourage the felling of mature trees to facilitate development and encourage tree surgery.
WH5	To encourage the preservation and enhancement of native and semi-natural woodlands, groups of trees and individual trees, as part of the development control process, and require the planting of native, and appropriate local characteristic species, in all new developments
WH6	To encourage the retention, wherever possible, of hedgerows and other distinctive boundary treatment in the County. Where removal of a hedgerow, stone wall or other distinctive boundary treatment is unavoidable, provision of the same type of boundary will be required of similar length and set back within the site in advance of the commencement of construction works on the site.

Policy Reference	Policy
Water Systems	
WT1	To implement the EU Water Framework Directive and associated River Basin and Sub-Basin Management Plans and the EU Groundwater Directive to ensure the protection, improvement and sustainable use of all waters in the County, including rivers, lakes, ground water, coastal and estuarine waters, and to restrict development likely to lead to a deterioration in water quality.
WT2	To resist development that would interfere with the natural water cycle to a degree that would interfere with the survival and stability of natural habitats.
WT3	To prevent development that would pollute water bodies and in particular, to regulate the installation of effluent disposal systems in the vicinity of water bodies that provide drinking water or development that would exacerbate existing underlying water contamination
WT4	To minimise alterations or interference with river / stream beds, banks and channels, except for reasons of overriding public health and safety (e.g. to reduce risk of flooding); a buffer of 10m along watercourses should be provided free of built development, with riparian vegetation generality being retained in as natural a state as possible. In all cases where works are being carried out, to have regard to Regional Fisheries Board "Requirements for the protection of fisheries habitat during the construction and development works at river sites"
WT6	To ensure that any development or activity with the potential to impact on ground water has regard to the GSI Groundwater Protection Scheme

Biodiversity Plans

4.16 Ireland's second National Biodiversity Plan (NBP)[4] identifies actions towards understanding and protecting biodiversity in Ireland with the vision "*that biodiversity and ecosystems in Ireland are conserved and restored, delivering benefits essential for all sectors of society and that Ireland contributes to efforts to halt the loss of biodiversity and the degradation of ecosystems in the EU and globally"*.

4.17 In addition to the NBP, a number of Local Biodiversity Action Plans have been produced including the Wicklow Biodiversity Action Plan 2010-2015 that identifies a programme of actions to protect and enhance biodiversity at the local level.

METHODOLOGY

4.18 Baseline ecological data were collated through a combination of desk-based study and field survey consistent with current standard methodologies and published good practice guidelines.

[4] Department of Arts, Heritage and the Gaeltacht (2011). *Actions for Biodiversity 2011-2016 - Ireland's National Biodiversity Plan*.

Area of Study

4.19 The area of study includes all land within the red line application boundary for the proposed development (9.1ha) as well as important ecological sensitive receptors within the wider surrounding area with the potential to be directly or indirectly affected by the development and operation of the proposed inert soil recovery facility and the backfilling and restoration of the void at Calary Quarry.

Desk-based Study

4.20 A preliminary desk-based study was undertaken which involved collating data from a number of organisations and examining published data relating both to the application site and a defined search area centred on the site. Data included:

- details of statutory and non-statutory designated nature conservation sites within a 5km radius of the application site and
- protected, rare and notable species within the 2km grid square encompassing the application site (grid square O21G).

4.21 Data sources consulted included those of the NPWS (www.npws.ie), accessed via its interactive mapping facility (www.designatedareas.ie), and those of the National Biodiversity Data Centre (www.biodiversityireland.ie).

Field Survey

4.22 The scope of the ecological field surveys was defined on the basis of known (and potential) ecological interest within the application site and best practice guidance[5]. This included the following surveys:

- Habitat Survey and
- Peregrine Survey.

4.23 Over and above the surveys detailed above, it was deemed that no other specialist surveys were necessary in respect of the habitats present at the site and their potential to support protected species.

Habitat Survey

4.24 A habitat survey was conducted at the application site on 10th February 2015 and repeated on 16th April 2015 by a senior ecologist from SLR. The survey was conducted following a standard methodology, in accordance with Fossitt (2009)[6], to Level 3 and involved the production of a map of the habitats present using colour codes and identification where applicable of target notes (TN) to describe any feature of particular ecological interest.

4.25 This survey method was extended to include the recording of additional information on habitats and species, including any evidence of, or potential presence of, statutorily protected species, other species of conservation significance, or any other features of note and may require mitigation or an ecologically sensitive design in respect of the proposed recovery facility at Calary Quarry.

[5] Institute of Environmental Assessment (1995). *Guidelines for Baseline Ecological Assessment*. Chapman and Hall (E & F N Spon), London.
[6] Fossitt, J. A. (2000). *A Guide to Habitats in Ireland*. The Heritage Council, Ireland.

Peregrine Survey

4.26 The Peregrine Survey was carried out at Calary Quarry in accordance with the methodology used by the British Trust for Ornithology (BTO) in its annual peregrine surveys in the United Kingdom.

4.27 The quarry was visited on 20th March, 16th April and 19th May 2015 to record any signs of occupation of the quarry by peregrine falcon. During each visit, a minimum of three hours observation was undertaken to identify any peregrine falcons at the quarry site or flying over adjacent areas that would indicate potential territory occupancy by this species.

Constraints and Uncertainty of Data

4.28 All field work was conducted during optimum times to undertake such surveys, based on the habitat-types present, and assessed to be representative of the habitats within the application site, including the dominant and characteristic species of flora.

4.29 The lack of evidence of any one particular protected species does not necessarily preclude its presence at the site either at this current time or in the future. It is considered however, that the timing of the site visits were suitable for protected species and their habitat-based assessment, as most species would have been active during this time and provided evidence of their presence.

Assessment Methodology

Evaluation of Ecological Features

4.30 The ecological features, identified through the desk-based study and field survey, were given a value based on a geographic context. Ecological features are defined as:

- designated sites (i.e. Natura 2000 sites, NHA, pNHA, National Nature Reserve) or non-statutory locally designated sites and features;
- sites, habitats and features of recognised biodiversity value but not designated as detailed above; and
- species protected or controlled by law or of biodiversity value or significance.

Evaluation Criteria

4.31 CIEEM suggest that to ensure a consistency of approach, ecological features are valued in accordance with the geographical frame of reference. For the purpose of this assessment the geographical frame of reference defined in assessment guidelines published by the National Roads Authority (NRA) [7] has been used, as detailed below:

- International;
- National;
- County;
- Local (higher); and
- Local (lower).

[7] NRA (2009). *Guidelines for Assessment of Ecological Impacts of National Road Schemes*. Revision 2. National Roads Authority.

4.32 The above categories are then applied to the features identified in baseline surveys and desk-based studies. Some feature can already be recognised as having ecological value and, as such, they may be designated as statutory or non-statutory designated nature conservation sites. Other features may require an evaluation based upon their previously un-assessed biodiversity value. A summary of the criteria used in the evaluation of designated sites, habitats and species is provided in Table 4.3.

Table 4.3
Criteria for the Evaluation of Designated Sites, Habitats and Species

Evaluation	Criteria
International	An internationally designated site or proposed site including Special Area of Conservation (SAC), Site of Community Importance (SCI) and Special Protection Area (SPA) and Ramsar site, or an area which has been determined meets the published selection criteria for such designations, irrespective of whether or not it has yet been notified. World Heritage Sites, where the ecological feature assessed is an intrinsic part of the natural heritage value that led to the designation. An intrinsic part of the core area of a designated Biosphere Reserve. Undesignated sites containing 'best examples' of Annex I habitats under the EU Habitats Directive. Major designated salmonid waters. A resident or regularly occurring population of an internationally important bird species listed in Annex I and/or referred to in Article 4(2) of the EU Birds Directive and/or a species of animal or plant listed in Annex II and/or IV of the EU Habitats Directive and which is threatened or rare in Ireland or of uncertain conservation status or of global conservation in the NBP. A resident or regularly occurring nationally significant population or of any internationally important species representing greater than 1% of its international population.
National	A nationally designated site (or proposed) National Heritage Area (NHA) or statutory Nature Reserve or Refuge for Fauna and Flora, or an area fulfilling the criteria for designations, irrespective of whether or not it has yet been notified. Undesignated sites containing good examples and viable areas of Annex I habitats under the EU Habitats Directive. A resident or regularly occurring population (>1% of the national population) of a nationally important species which is protected under the Wildlife Acts and or listed on a relevant Red Data list.

Evaluation	Criteria
County	Areas identified as Areas of Special Amenity, subject to a Tree Preservation Order or Area of High Amenity (where designated on the basis of their ecological value). Site containing area or areas of habitat types listed in Annex I of the EU Habitats Directive that do not fulfil the criteria for valuation of International or National importance. A resident or regularly occurring locally significant population (>1% of the county population) of a county important species and/or a species protected under the Wildlife Acts or listed in Annex I of the EU Birds Directive, Annex II and/or IV of the EU Habitats Directive or on a relevant Red Data list assessed to be important at County level. County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified within the NBP and/or Local BAP. Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county. Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.
Local (Higher)	Locally important populations of priority species or habitats or natural heritage features identified in any Local BAP. A resident or regularly occurring locally significant population (>1% of the local population) and/or a species protected under the Wildlife Acts or listed in Annex I of the EU Birds Directive, Annex II and/or IV of the EU Habitats Directive or on a relevant Red Data list assessed to be important at the Local level. Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality. Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.
Local (Lower)	Sites containing small areas of semi-natural habitat that are of some local importance for wildlife.

4.33 A second stage of evaluation entails a collective review of the differing levels of importance of the various habitats and species present, in order to reach an evaluation of the application site as a whole. Ultimately, this evaluation is also a matter of professional judgement, guided by published sources, consultation responses and local knowledge.

Assessment of Impacts

4.34 The assessment of potential ecological impacts has been carried out using the guidelines published by the EPA and the CIEEM and can be summarised as:

- the identification of the range of potential impacts that may arise from the proposed development;
- the consideration of the systems and processes in place to avoid, reduce and mitigate the possible effects of these impacts;
- the identification of opportunities for ecological enhancement within the proposed development;

- an assessment of the residual impacts, taking account of the implementation of avoidance, mitigation and enhancement measures; and
- where necessary, the identification of compensation required to offset any residual effects.

4.35 Impacts are defined as being negative, neutral or positive. The term significant is independent of the value of the receptor. A significant impact is defined as an impact on the integrity of a defined ecosystem and/or the conservation status of habitat or species within a given geographical area.

4.36 Where a potential negative impact has been identified, measures to prevent, reduce or offset a significant effect have been formulated using best practice techniques and guidance.

ECOLOGICAL BASELINE CONDITIONS

4.37 This section provides a general overview of the existing ecological baseline conditions at the application site and within the wider local environment.

General Site Description

4.38 The application site comprises a quarry at which quarrying operations were suspended in 2010. Since that time, the quarry void has gradually becoming flooded and natural re-colonisation of the quarry site has begun, creating a mosaic of habitats in the early stages of development.

Designated Sites

4.39 The application site is not subject to any statutory or non-statutory nature conservation designations.

4.40 Within the 5km radius there are five statutory designated nature conservation site and eight non-statutory designated sites that include:

- statutory designated sites:
  - Glen of the Downs SAC [site code 000719];
  - Wicklow Mountains SPA [004040];
  - Wicklow Mountains SAC [002122];
  - Knocksink Wood SAC [000725]; and
  - Carriggower Bog SAC [000716].
- non-statutory designated sites:
  - Great Sugar Loaf pNHA [001769];
  - Powerscourt Waterfall pNHA [001767];
  - Powerscourt Woodland pNHA [001768];
  - Glen of the Downs pNHA [000719];
  - Glencree Valley pNHA [001755];
  - Dargle River Valley pNHA [001754];
  - Knocksink Wood pNHA and Nature Reserve [000725]; and
  - Carriggower Bog pNHA [000716].

4.41 The locations of these designated sites in relation to the application site are shown in Figure 4.1.

Habitats

Application Site

4.42 The application site comprises a quarry void that supports a mosaic of artificial and semi-natural habitats that have developed since the cessation of quarrying operations, through the natural re-colonisation process.

4.43 The main habitat types recorded within the application site based on the classification as defined by Fossitt (2000) are presented in Table 4.4. The location and extent of habitats recorded within the site is shown in Table 4.2.

Table 4.4
Summary of Main Habitat Types Recorded at the Application Site

Level 1 Habitat Hierarchy	Level 2 Habitat Hierarchy	Level 3 Habitat Hierarchy
E - Exposed rock and disturbed ground	ED - Disturbed ground	ED2- Spoil and bare ground
		ED3 – Recolonising bare ground
	ER – Exposed rock	ER1 – Exposed siliceous rock
		ER3 – Exposed siliceous scree and loose rock
F – Freshwater	FL – Lakes and ponds	FL8 – Other artificial lakes and ponds
G - Grassland and marsh	GS - Semi-natural grassland	GS2 - Dry meadows and grassy verges
W - Woodland and scrub	WS – Scrub / transitional woodland	WS1 - Scrub
B - Cultivated / built land	BL – Built land	BL3 – Buildings / artificial surfaces

E – Exposed Rock and Disturbed Ground

4.44 The quarry has been stripped of its soils and sub-soils and quarried of stone leaving behind walls rising some 60m from the floor of the quarry. The walls comprise of areas of *ER1 – Exposed siliceous rock* and *ER3 – Exposed siliceous scree and loose rock* consisting of boulders, cobbles within a sand and gravel till. The quarry walls are largely devoid of vegetation, with the exception of some colonisation of Gorse (*Ulex europaeus*) on some ledges where sand and gravel till is present.

4.45 In other parts of the quarry site, that historically have been subject to high level of disturbance, habitats typically comprise of *ED2 – Spoil and bare ground* and *ED3 – Recolonising bare ground* habitats. In most cases the species composition is similar, with only the ground coverage of vegetation different. In places the *ED3 – Recolonising bare ground* is in early stages of succession to *GS3 – Dry-humid acid grassland*.

4.46 Species present include: the graminoids of Common Bent (*Agrostis capillaris*), Crested Dog's-tail (*Cynosurus cristatus*), Cock's-foot (*Dacytlis glomerata*), Red Fescue (*Festuca rubra* agg.), Sheep's Fescue (*Festuca ovina*), Annual Meadow-grass (*Poa annua*) and Soft Rush (*Juncus effusus*); and the herbs of Common Mouse-ear (Ceratium fontanum), Spear Thistle (*Cirsium vulgare*), Foxglove (*Digitalis purpurea*), Teasel (*Dipsacus fullonum*), Cat's-ear (*Hypchaeris radicata*), Selfheal (*Prunella vulgaris*), Common Ragwort (*Senecio*

jacobaea) and Colt's-foot (*Tussilago farfara*). Bryophytes form a conspicuous component of the vegetation that includes: *Ceratodon pupureus*, *Hypnum cupressiforme*, *Hylocomium splendens* and *Polytricum piliferum*. Gorse encroach is evident throughout.

F – Freshwater

4.47 The quarry void has become flooded through the cessation of dewatering operations creating a relatively large area of *FL8 - Other artificial lakes and ponds* habitat extending through the central part of the quarry site and which has a depth up to 25m. As far as could be ascertained this waterbody is currently devoid of any aquatic or marginal vegetation.

G – Grassland and Marsh

4.48 A small bund running along eastern edge of the access track which runs from the former infrastructure areas to the south of the quarry site supports *GS2 – Dry meadows and grassy verges* habitat. The grassland sward is dominated by Cock's-foot and Red Fescue. The herbaceous component is species-poor comprising Hogwood (*Heracleum sphondylium*), Ribwort Plantain (*Plantago lanceolata*), Field Forget-me-not (*Myostis arvensis*), Creeping Buttercup (*Ranunculus repens*), Broad-leaved Dock (*Rumex obtusifolius*), Common Ragwort and Common Nettle (*Urtica dioica*), as well as the moss *Rhytidiadelphus squarrosus*.

W – Woodland and Scrub

4.49 Patches of scrub typically dominated by Gorse are present on the screening bund along the western edge of the flooded quarry void and along and adjacent to the boundaries of the application site. Other woody species present include Broom (*Cytisus scoparius*), Bramble (*Rubus fruticosus* agg.) and Stone Bramble (*Rubus saxatilis*) that, where present, forms dense homogenous creeping vegetation.

4.50 In areas not disturbed or subject to high levels of historic disturbance, species typically found include Sweet Vernal-grass (*Anthoxanthum odoratum*), Foxglove, Barren Strawberry (*Potentilla sterilis*), Alexanders (*Smyrnium olusatrum*), Wood Sage (*Teucrium scorodonia*), Black Spleenwort (*Asplenium adiantum-nigrum*), Hart's-tongue Fern (*Asplenium scolopendrium*) and Maidenhair Spleenwort (*Asplenium trichomanes*), Male Fern (*Dryopteris filix-mas*) as well as the moss of *Kindbergia praelonga*.

B – Cultivated and Built Land

4.51 Access into the quarry and the site of the former infrastructure area comprises BL3 – *Buildings and artificial surfaces* that includes hard-standing areas and a number of small derelict buildings and other structures including a portacabin type building and services shed.

Immediate Surrounding Area

4.52 The habitats within the immediately surrounding area of the application site include areas of WS1 – Scrub dominated by Gorse to the north, east and south of the site, with patches of HH1 – Dry Siliceous heath, HH3 – Wet heath and HD1 – Dense bracken also present with some open pasture also present. To the west lies the R755 Regional Road, beyond which lies agricultural land under permanent pasture, with patches of semi-natural broadleaved woodland on the steeper slopes of the Killough River Valley

Species

Flora

Protected and Notable Species of Flora

4.53 NPWS holds very old records for Red Hemp Nettle (*Galeopsis angustifolia*), Bog Orchid (*Hammarbya paludosa*), Penny Royal (*Mentha pulegium*), Round Prickly-headed Poppy (*Papaver hybridum*) Annual Knawel (*Scleranthus annuus*) and Killarney Fern (*Trichomanes speciosum*) for 10km grid square O21. None of these records relate to the application site.

4.54 No records for protected, rare or notable species of plants were returned by the National Biodiversity Data Centre (NBDC) within the 2km search area.

4.55 During the Habitat Survey, no protected, notable or rare species of flora were recorded on, or immediately adjacent to, the application site.

Non-native Invasive Species

4.56 No non-native invasive species of flora, as listed under the either the Wildlife Act 1976 or Wildlife (Amendment) Act 2000, were found within, or immediately adjacent to the application site.

Mammals

Badger (Meles meles)

4.57 NBDC returned a solitary record for badger in the 2km search area. This record does not relate to the application site.

4.58 During the Habitat Survey, no evidence of badger activity (i.e. setts, tracks, latrines, snuffle holes or hairs) was found at, or within 30m of, the application site boundary.

Bats (All Species)

4.59 No records for bat species were returned by NBDC in the 2km search area.

4.60 The application site does not support any buildings, trees, structures or features that are considered to offer potential and/or suitable bat roosting opportunities. During an inspection of on-site structures in the course of the Habitat Survey, no evidence was found to suggest bats have used, or are currently using these structures for roosting purposes (i.e. droppings, urine staining, scratch marks and feeding remains).

4.61 The quarry walls are assessed as having negligible to low bat roosting potential with no obvious cracks, crevices or holes present which could be considered suitable for use by crevice dwelling bat species.

4.62 The application site provides low quality foraging habitat for bats when compared to the extensive and higher quality foraging habitat in the wider surrounding area.

Irish Hare (Lepus timidus hibernicus)

4.63 NBDC returned two records for Irish hare within grid square O21G.

4.64 Irish hares typically prefer largely undisturbed areas with species-rich and tall vegetation. The application site provides limited opportunities for this species and no individuals were observed during site any of the visits to the site or evidence found to suggest the presence of this species within the site.

Other Mammal Species

4.65 During the Habitat Survey evidence was found of rabbit (*Oryctolagus cuniculus*) within the application site.

4.66 Whilst the application site has the potential to support a number of small mammals, no evidence was found to indicate the presence of any other protected species of mammal.

Birds

4.67 NBDC returned records for a number of bird species, the most notable of which is merlin (*Falco columbarius*) within grid square O21G.

4.68 The habitats present at the application site provide a range of opportunities for a number of bird species typically associated with quarry sites, gorse scrub and open water habitats. Table 4.5 provides a summary of the bird species recorded at the application site during the Habitat and Peregrine Surveys.

4.69 Of the species recorded, only peregrine falcon (*Falco peregrinus*) is listed under Annex I of the EU Birds Directive but was not confirmed as breeding at the quarry. Only one red listed[8] and two amber listed[9] Birds of Conservation Concern[10] were recorded all of which have the potential to breed at this site.

Table 4.5
Summary of Birds Recorded at Calary Quarry

Scientific Name	Common Name	EU Birds Directive	Red List	Amber List
Anthus pratensis	Meadow Pipit	-	✓	-
Carduelis cannabina	Linnet	-	-	✓
Columba palumbas	Woodpigeon	-	-	-
Corvus corax	Raven	-	-	-
Corvus frugilegus	Rook	-	-	-
Corvus monedula	Jackdaw	-	-	-
Erithacus rubecula	Robin	-	-	-
Falco peregrinus	Peregrine falcon	✓	-	-
Motacilla alba	Pied Wagtail	-	-	-
Oenanthe oenanthe	Wheatear	-	-	✓
Phylloscopus trochilus	Willow Warbler	-	-	-
Prunella modularis	Dunnock	-	-	-
Troglodytes troglodytes	Wren	-	-	-
Turdus merula	Blackbird	-	-	-

[8] Red list species are those that are Globally Threatened according to IUCN criteria; those whose population or range has declined rapidly in recent years; and those that have declined historically and not shown a s substantial recovery.
[9] Amber list species are those with an unfavourable conservation status in Europe; those whose population or range has declined moderately in recent years; those whose populations has declined historically but made a substantial recovery; rare breeders; and those with international important or localised populations.
[10] Lynas, P., Newton, S. F., & Robinson, J. A. (2009). *The Status of Birds in Ireland: An analysis of Conservation Concern 2008-2013.* Irish Birds, 8(2): 149-166.

Reptiles

4.70 There are no historical records for common lizard (*Zootoca vivipara*) within the 2km search area.

4.71 Although common lizard is a species that can be found in wide range of habitats, the application site provides sub-optimum habitat for this species at this current time and it is considered highly unlikely to be present at this location.

Amphibians

4.72 There are no historical records for both common frog (*Rana temporaria*) and smooth newt (*Lissotriton vulgaris*) within the 2km search area.

4.73 During the Habitat Survey, no evidence was found to indicate common frog and/or smooth newt were present and breeding in the flooded quarry floor or any individuals found during the turning of suitable artificial refugia close to this waterbody.

4.74 The application site provides low quality terrestrial habitat for both common frog and smooth newt.

Invertebrates

4.75 NBDC returned records for a number of invertebrates for the 2km search area, of which grayling (*Hipparchia semele*) is the most notable species.

4.76 Whilst no site is without invertebrate interest, it is considered highly unlikely that the application site would support any protected or rare invertebrate species, based on the habitats present.

Other Protected, Rare and Notable Species

4.77 During the habitat surveys, no other protected, rare or notable species were recorded. Though the site may support low numbers of common and widespread species, it is considered highly unlikely that any protected, rare or notable species would be present, based on the existing habitats and the levels of disturbance to these areas

Predicted Trends

4.78 In the absence of the proposed development, there is no reason to believe that the current baseline, as described above, would change significantly over the short-to-medium term.

4.79 In the longer term the habitats would continue to develop with gorse scrub continuing to encroach across the site.

ECOLOGICAL EVALUATION

Evaluation of Ecological Receptors

4.80 An evaluation of the ecological features, including designated sites, habitats and species, identified through the findings of desk-based study and field survey are summarised in Tables 4.6, 4.7 and 4.8 respectively.

Table 4.6
Evaluation of Designated Sites

Level of Value	Site/Feature at this Value	Location Relative to Application Site	Reason for Importance/Designation
International	Glen of the Downs SAC	2.3 km south east at closest point	Designated as a SAC for the following habitat types listed under Annex I of the EU Habitats Directive: • Old sessile oak woods with *Ilex* and *Blechnum* in British Isles
	Wicklow Mountains SPA	2.5km west southwest at closest point	Classified a SPA because it regularly supports bird populations of European importance that include: • merlin (*Falco columbarius*); and • peregrine falcon (*Falco peregrinus*).
	Wicklow Mountains SAC	3.2km west at closest point	Designated as a SAC for the following habitat types listed under Annex I of the EU Habitats Directive: • Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea; • Natural dystrophic lakes and ponds; • Northern Atlantic wet heaths with Erica tetralix; • European dry heaths; • Alpine and Boreal heaths; • Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe); • Blanket bogs (priority if active bog); • Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani); • Calcareous rocky slopes with chasmophytic vegetation; • Siliceous rocky slopes with chasmophytic vegetation; and • Old sessile oak woods with Ilex and Blechnum in British Isles. The site is also selected for the following species listed on Annex II of the EU Habitats Directive: • Otter (Lutra lutra).
	Carriggor Bog SAC	4.6km north at closest point	Designated as a SAC for the following habitat types listed under Annex I of the EU Habitats Directive: • Transition mires and quaking bogs.

Level of Value	Site/Feature at this Value	Location Relative to Application Site	Reason for Importance/Designation
	Knocksink Wood SAC	4.6km south at closest point	Designated as a SAC for the following habitat types listed under Annex I of the EU Habitats Directive: • Petrifying springs with tufa formation (Cratoneurion); and • Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion inacanae, Salicion albae).
National	Great Sugar Loaf pNHA	Adjoining eastern boundary of application site	A site of both ecological and geological interest that supports dry mountain heath and upland grassland, with exposed rocky outcrops and areas of screen on the mountain sides.
	Powerscourt Waterfall pNHA	2.1km west at closest point	This site is important because it has one of the most spectacular waterfalls in Ireland and it shows good exposures of schist and granite. The area is important botanically for its rare and scarce flowering plants, ferns, bryophytes and lichens.
	Powerscourt Woodland pNHA	2.0km west northwest at closest point	A mixed woodland within the two large demesnes of Powerscourt and Charleville (with 4km of Dargle River)
	Glen of the Downs pNHA	2.3 km south east at closest point	A semi-natural oak woodland with some areas of mixed woodland that support a number of rare bryophytes and fungi as well as invertebrates, including *Mycetobia obscura.*
	Glencree Valley pNHA	3.1km north west at closest point	A good example of deciduous woodland, with an upland river and boggy flushes that add to the habitat diversity of the site.
	Dargle River Valley pNHA	3.2km north at closest point	A fine example of a wooded valley which is also of considerable geological importance.
	Knocksink Wood pNHA and Nature Reserve	4.6km south at closest point	A woodland situated in the valley of the Glencullen River that is dominated by sessile oak on some of the valley slopes, but with wet alluvial woodland associated with frequent and extensive springs and seepages, with tufa formation in several places.
	Carriggower Bog pNHA	4.6km north at closest point	A mosaic of transition bog habitats supports a wide range of poor fen / bogland invertebrates, including a suite of wetland species of international importance of which most are within the Order Diptera.

Table 4.7
Evaluation of Habitats

Level of Value	Receptor	Location	Rationale
Local (lower)	ED2- Spoil and bare ground	Application site	A habitat historically subject to high levels of disturbance, with little botanical interest and offering very limited opportunities for fauna.
	ED3 – Recolonising bare ground	Application site	A habitat historically subject to high levels of disturbance, with little botanical interest and offering very limited opportunities for fauna.
	ER1 – Exposed siliceous rock	Application site	Habitat created through former quarrying operations and providing opportunities for some nesting bird species including peregrine falcon as it lies within the core range for an alternative nesting site of the population associated with the Wicklow Mountains SPA. However, until confirmed as a nesting site for peregrine falcon habitat remains of low nature conservation value.
	ER3 – Exposed siliceous scree and loose rock	Application site	Habitat created through former quarrying operations comprising loose rocks and soils.
	FL8 – Other artificial lakes and ponds	Application site	A recently formed waterbody through the flooding of the quarry floor that, at the current time, is of low ecological and nature conservation value.
	GS2 - Dry meadows and grassy verges	Application site	Typically common and widespread habitat of low botanical interest that provides limited opportunities for wildlife.
	WS1 - Scrub	Application site and immediate surrounding area	A typical common and widespread habitat dominated by gorse that provides some opportunities for birds and invertebrates.
	BL3 – Buildings and artificial surfaces	Application site	Anthropogenic habitats of negligible ecological value.

Table 4.8
Species Evaluation

Level of Value	Receptor	Location	Rationale
Local (lower)	Bat assemblage	Application site and immediate surrounding area	All bat species are fully protected under the Wildlife Act 1976 as amended by the Wildlife (Amendment) Act 2000 and the European Communities (Birds and Natural Habitats) Regulations 2011. The application site provides some foraging habitat for a range of bat species but is not likely to be important or critical to any particular species of bat or to the maintenance of the local population status of any bat species.
	Bird assemblage	Application site immediate surrounding area	Protected under the Wildlife Act 1976 as amended by the Wildlife (Amendment) Act 2000 The application site provides opportunities for a range of species associated exposed rock faces, scrub and open water but is not likely to be important or critical for any particular individual species or local populations of birds given the availability of alternative habitat in the wider surrounding area. Site within the core range for an alternative nesting site of the population associated with the Wicklow Mountains SPA but until confirmed as a breeding at this site of low nature conservation value given the extent of potential alternative nest sites within the surrounding areas of the Wicklow Mountains SPA.
	Invertebrates	Application site and immediate surrounding area	The site provides potential habitat for a range of invertebrates but is unlikely to be important or critical to any particular species or taxonomic group given the availability of alternative habitat in the wider surrounding area.

Value of Whole Site

4.81 The application site does not have any statutory or non-statutory nature conservation designations, but lies immediately adjacent to the Great Sugar Loaf pNHA.

4.82 The application site comprises a quarry that currently supports habitats which are ubiquitous, anthropogenic and of intrinsically low nature conservation value and which are considered to be of Local (lower) Value.

4.83 The application site provides limited opportunities for fauna and is unlikely to be important or critical for any particular species or population given the availability of extensive similar habitats in the wider surrounding area. Although the quarry is likely to have territory occupancy by peregrine falcon it is not currently being used for breeding purposes.

4.84 Based on the above, the application site at this current time is considered to be of Local (lower) value but with the potential to be of higher value were the site to be used for breeding purposes by peregrine falcon.

Summary of Ecological Receptors for Impact Assessment

4.85 In accordance with published CIEEM and NRA guidelines, where receptors have been evaluated at a value of Local (lower), no further assessment is deemed necessary, as the impact on these receptors is not likely to be of significance. However, it should be noted that mitigation measures may still be required to ensure protection of receptors to comply with current wildlife legislation and best practice guidelines (i.e. breeding birds).

4.86 The following valuable ecological receptors have been identified with the potential to be affected by the proposed backfilling and restoration of Calary Quarry using imported inert soil and stone and are carried forward for further ecological impact assessment:

- designated sites:
  - Glen of the Downs SAC;
  - Wicklow Mountains SPA;
  - Wicklow Mountains SAC;
  - Knocksink Wood SAC;
  - Carriggower Bog SAC;
  - Great Sugar Loaf pNHA;
  - Powerscourt Waterfall pNHA;
  - Powerscourt Woodland pNHA;
  - Glen of the Downs pNHA;
  - Glencree Valley pNHA;
  - Dargle River Valley pNHA;
  - Knocksink Wood pNHA and Nature Reserve; and
  - Carriggower Bog pNHA.

ECOLOGICAL IMPACT ASSESSMENT

4.87 This section assesses the ecological impacts from the proposed operation of an inert soil recovery facility and the backfilling and restoration of a quarry void at Calary Quarry, based on the baseline information obtained from the preliminary desk-based study, baseline surveys and evaluation of the ecological features. Both qualitative and quantitative information has been used to identify likely significant ecological impacts, including the positive, negative, direct, indirect and the cumulative environmental effects.

4.88 To assess the effects of the development it is essential that the impacts that could arise are identified and characterised. The impacts that require consideration in the EcIA are based upon knowledge of the proposed development and of the Valued Ecological Receptor (VERs). This can only be undertaken with a thorough understanding of ecological processes and how flora and fauna react to the range of impacts that could occur.

Development Overview

4.89 A detailed description of the development is presented in Chapter 2 of the EIS, but in summary the development basically involves:

- the importation and recovery of up to 3,280,000 tonnes (1.82 million cubic metres) of inert soil and stone and minor quantities of virgin aggregate (for haul road construction) to backfill / infill the existing quarry void to a final ground level of approximately 290mOD on the eastern side of the quarry and approximately 250mOD on its western side;
- Construction of temporary site infrastructure and services including, site office, staff welfare facilities, weighbridge (with dedicated office), wheelwash, settlement ponds, pumphouse, hardstand areas, fuel and water storage tanks, waste inspection and quarantine facility and storage sheds;
- Temporary stockpiling of topsoil pending re-use as cover material for final restoration of the site;
- Restoration of the infilled void to a heathland / grassland habitat, similar to that which originally existed prior to quarrying.

4.90 On completion of backfilling and restoration of the landform to its pre-quarrying state, it will be seeded with a native grass mix in order to promote stability and minimise soil erosion and dust generation. Thereafter, the restored site will be left largely unattended, to be naturally recolonised by native vegetation. It is expected that over time, the infilled site will return to a heathland / grassland habitat, similar to that which originally existed prior to quarrying.

Identification and Characterisation of Potential Impacts

4.91 The sources of potential impacts arising from the proposed backfilling and restoration of Calary Quarry, in the absence of mitigation, are outlined in Table 4.9 below:

Table 4.9
Summary of the Sources of Potential Impacts

Impact Source	Nature of Impact
Habitat loss through land take	Habitat loss involves the direct destruction or physical take-up of vegetation, or the removal of other structures with conservation interest. Habitat loss may also occur indirectly as a result of a change in land-use or water management, for instance the drying-up of wetland systems or through induced successional events leading to a change in habitat type.
Habitat fragmentation	Habitat fragmentation is concerned with spatial processes, such as negative edge effects (e.g. colonisation by 'aggressive' species or successional changes) and dispersal problems that can become increasingly severe as habitat is lost and remaining habitat is divided into smaller units. Fragmented habitats are likely to be more vulnerable to external factors that may have a negative effect upon them; e.g. disturbance, and may be less resilient to change (including climate and management change) than connected habitats because colonising species may be unable to reach the habitat to re-colonise in the event of species loss.

Impact Source	Nature of Impact
Damage to wildlife	Habitat loss can have a direct impact on individual populations and assemblages of species resulting in the direct loss of individuals or populations of animal species, or in indirect loss through increasing levels of stress placed upon populations of some species through negative edge effects (e.g. predation pressure) and dispersal problems that can become increasingly severe as habitat is lost and the remaining habitat is divided into smaller units.
Disturbance from human activity, noise and vibration	Increases in disturbance, including noise and visual disturbance, from human activity can have a range of impacts depending upon the sensitivity of the ecological receptor, the nature and duration of the disturbance and its timing. The response of individual species to increased levels of human disturbance will depend upon a number of factors including the sensitivity, reproductive status, previous exposure to human disturbance, behaviour during the event, species tolerance to disturbance, location in relation to the source, availability of alternative nearby habitat, and environmental factors (i.e. topography, vegetation and atmospheric conditions which can influence noise levels). The level of disturbance will also be dependent upon existing ambient noise levels and maximum noise levels. It is generally accepted that for noise, certain species or groups of species can be impacted upon up to a distance of up to 300m from its source for high level and discontinuous disturbance, with these distances reducing for low level and/or continuous disturbance levels.
Dust deposition	The importation of soils and stone, traffic movements and other associated works has the potential to generate dust. Literature suggests that the most sensitive species are only likely to be affected by dust deposition at levels above 1000 mg/m^2/day[11] which is five times greater than the level at which most dust deposition may start to cause a perceptible nuisance to humans. Fugitive dust from quarry and construction sites is typically deposited within 100-200m of the source; the greatest proportion of which, comprising larger particles (greater than 30 microns) is deposited within 100m[12]. Where large amounts of dust are deposited on vegetation over a long time-scale (a full growing season for example) there may be some adverse effects upon plants restricting photosynthesis, respiration and transpiration. The amounts of dust deposited and its effects are also dependent upon weather conditions, as in wet weather less dust will be generated and that which has been deposited upon foliage is more likely to be washed off.

[11] Farmer, A.M. (1993). *The Effects of Dust on Vegetation – A Review*. Environmental Pollution Vol.79, Issue 1, Pages 63-75.
[12] Department of the Environment (1995). *The Environmental Effects of Dust from Surface Mineral Workings. Volume 1: Summary Report & Best Practice Guides.* HMSO.

Impact Source	Nature of Impact
Changes in ground and surface water quality	Surface water discharges and diffuse pollution from surface water run-off can contribute to a reduction in water quality through a net contribution of nutrients or contamination from a wide range of organic and inorganic compounds. Contamination of groundwater can occur through the direct recharge of groundwaters close to the ground surface, or of deeper aquifers through percolation and other hydrological pathways that may affect surface waters (where there is a potential ground and surface water hydraulic connectivity).
Changes in air quality (traffic emissions)	The main pollutants from traffic emissions of primary concern for ecology are nitrogen oxides (NOx) and oxides of sulphur, mainly sulphur dioxide (SO_2), together with the acidification and eutrophication associated with acid and nitrogen deposition upon sensitive ecosystems that can occur when these substances are deposited to land at high rates. High rates of nitrogen deposition upon sensitive ecosystems can increase the eutrophication of soils and water which can have a detrimental effect on species-rich plant communities and semi-natural habitats that are often associated with a low nutrient status. Eutrophication can decrease species diversity and the dominant plant species can change to those better to respond to increased nitrogen levels. Acid deposition, whether from SO_2, NO_X or ammonia formed by the reaction of SO_2 and NO_X, can affect habitats by changing the species composition of plants and their associated communities of fauna. Acid deposition can occur through both wet and dry deposition. Under National Roads Authority guidelines[13] detailed consideration need only to be given to emissions to air where there is a significant change to traffic flows (>5%) and a designated nature site lies within 200m of the road centre line.

Refining the Scope of Potential Impacts

4.92 Potential ecological impacts are defined in terms of predicted changes to the baseline conditions of a particular VER, whether negative, or positive, that can be directly and indirectly attributable to the proposed waste recovery facility.

4.93 Based upon the knowledge of the application site, the development proposals and the likely effects on the VERs, it is possible to further refine the scope of the EcIA to focus upon those VERs and impact interactions which are likely to be most significant. Table 4.10 presents a matrix of the potential impacts and receptors and identifies the interactions which are likely, or have the potential, to change baseline conditions as a result of the proposed development at Calary Quarry.

[13] National Roads Authority (2006). *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes*. National Road Authority.

Table 4.10
Scoping Matrix of Likely Impacts and Impact Interactions

VER	Habitat loss and Fragmentation	Disturbance from Human Activity and Noise	Dust Deposition	Changes in Ground and Surface Water Quality	Changes in Air Quality (Traffic Emissions
Glen of the Downs SAC	x	x	x	x	√
Wicklow Mountains SPA	x	x	x	x	x
Wicklow Mountains SAC	x	x	x	x	x
Knocksink Wood SAC	x	x	x	x	x
Carriggower Bog SAC	x	x	x	x	x
Great Sugar Loaf pNHA	x	√	√	x	√
Powerscourt Waterfall pNHA	x	x	x	x	x
Powerscourt Woodland pNHA	x	x	x	x	x
Glen of the Downs pNHA	x	x	x	x	√
Glencree Valley pNHA	x	x	x	x	x
Dargle River Valley pNHA	x	x	x	√	x
Knocksink Wood pNHA and Nature Reserve	x	x	x	x	x
Carriggower Bog pNHA	x	x	x	x	x

4.94 Based the scoping matrix in Table 4.10, the following VERs are not likely to be affected by the proposed development and no further assessment is deemed necessary:

- Wicklow Mountains SPA;
- Wicklow Mountains SAC;
- Knocksink Wood SAC;
- Carriggower Bog SAC;
- Powerscourt Waterfall pNHA;
- Powerscourt Woodland pNHA;
- Glencree Valley pNHA;
- Knocksink Wood pNHA and Nature Reserve; and
- Carriggower Bog pNHA.

Assessment of Effects

4.95 The following section details the assessment of predicted effects on the relevant VERs during the operation of the proposed waste recovery facility at Calary Quarry and the restoration of the existing quarry void by backfilling using imported inert soil and stone waste and establishing a heathland / grassland habitat.

Habitat Loss and Fragmentation

4.96 The proposed restoration works, by backfilling the quarry void using imported inert soil and stone, will result in the loss of 9.1 ha of habitats that are present within the existing quarry site. All the habitats that would be lost are of low ecological and nature conservation value, the loss of which is not predicted to be significant.

4.97 Outside the development footprint, there would be no direct habitat loss, damage or fragmentation of any designated site or other valued habitat, including the Great Sugar Loaf pNHA immediately upslope of Calary Quarry.

Damage to Wildlife from Habitat Loss and Fragmentation

4.98 No valued species of fauna have been identified as being present in or immediately adjacent the application site. The proposed development is therefore not predicted to have a significant impact on any valued individual or group of species, and is not likely to impact upon the local population status of any species that may be present at this site.

4.99 Whilst the quarry is likely to form part of a territory used by peregrine falcon, the backfilling operations are not predicted to have a significant impact on the territory status of this species which can extend over many kilometres.

4.100 The proposed backfilling operations are not predicted to result in any significant barrier to the movement of species in the wider surrounding area

Disturbance from Human Activity, Noise and Vibration

4.101 It is anticipated that the backfilling operations and restoration of Calary Quarry would take in the region of 10 to 12 years to complete. During this period there would be an increase in human disturbance and noise generated by the operation of the inert soil recovery facility, backfilling of the quarry void and vehicle movements. This has the potential to disturb habitats and associated species within the area immediately surrounding the application site.

4.102 The only valued receptor which any increase in disturbance has the potential to impact upon is the Great Sugar Loaf pNHA.

Great Sugar Loaf pNHA

4.103 Under AQTAG09[14], where specific noise from industry, or industrial related activity, measured at a habitat / nest site is below the level of 55dB $L_{Aeq,1hr}$, it is considered unlikely that it will have any adverse impact.

4.104 The noise assessment carried out as part of the EIA and presented in Chapter 9 indicates that the predicted $L_{Aeq,1hr}$ noise levels within the Great Sugar Loaf pNHA would be at 43dB. At these levels there would be a negligible effect on noise levels in the Great Sugar Loaf pNHA.

4.105 No significant impacts are predicted on any individual or groups of species that may be present within this pNHA including any territory used by peregrine falcons. Any peregrine falcons with territories extending across the Great Sugar Loaf pNHA and wider surrounding areas will already be somewhat habituated to a degree of human disturbance with no significant changes predicted in the behaviour, distribution or local population status of peregrine falcon in the immediate and wider surrounding area

[14] Ormerod, L., Goodlad, N. and Horton, K. (2005) A*QTAG09 – Guidance on the Effects of Industrial Noise on Wildlife*. Air Quality Technical Advisory Group.

Dust Deposition

4.106 The operation of the inert soil recovery facility, storage and movement of soil waste materials, backfilling of the quarry void and vehicle movements have the potential to generate fugitive dust.

4.107 Most fugitive dust generated from the operation of the inert soil recovery facility and backfilling of the quarry void is likely to be deposited within 100-200m of its source. At this distance the only valued receptors with the potential to be affected is the Great Sugar Load pNHA.

Great Sugar Loaf pNHA

4.108 It is predicted that dust deposition from the operation of the inert soil recovery facility and backfilling of the quarry void will not exceed 350mg/m^2/day, in accordance with EPA guidelines for dust deposition at extractive sites, and well below the level of 1000 mg/m^2/day where it is considered that dust could be likely to have a significant effect on sensitive ecosystems.

4.109 The habitats within the Great Sugar Load pNHA immediately adjacent to the application site have been subject to varying levels of dust deposition from former quarrying operations. This would indicate that the habitats and supporting flora present are pretty tolerant and resilient to historical deposition of dust arising from the application site. None of the habitats present within the potential zone of influence of the proposed inert soil recovery facility (up to 500m radius) are considered to be sensitive to dust deposition.

4.110 Therefore no significant impact on Great Sugar Loaf pNHA is predicted from the deposition of fugitive dust generated during the operation of the inert soil recovery facility.

Changes to Water Quality (Ground and Surface Water)

4.111 Calary Quarry lies above the Wicklow Groundwater Body (GWB), as characterised by the GSI (Groundwater Web Mapping) for the implementation of the Water Framework Directive (WFD) (2000/60/EC). The Wicklow GWB is classified as being of 'good' groundwater quality status under the WFD.

4.112 The low permeability nature of the localised bedrocks will mean that the risk of groundwater contamination from the operation of the inert soil recovery facility and backfilling of the quarry void is negligible, provided appropriate pollution prevention measures are implemented, as detailed in Hydrology and Hydrogeology assessment presented at Chapter 6 of the EIS.

4.113 No significant effects are predicted on any groundwater dependent designated sites and/or habitats within the wider surrounding area as a result of the operation of the inert soil recovery facility and backfilling activities at Calary Quarry.

4.114 Calary Quarry lies within the catchment of the Killough River, that flows along the bottom of a steep sided valley to the west of the application site in a northerly direction before joining the Dargle River downstream of Tinnehinch Bridge.

4.115 The Killough River is not assessed under the WFD with the exception of a small section along its lower reach where it is assessed as being of 'moderate' quality status. The Dargle River is classified as a salmonid river and is also assessed as being of 'moderate' quality status up and downstream of its confluence with the Killough River until its outflow to the sea at Bray.

4.116 The Environmental Protection Agency's (EPA) latest assessment of water quality for the Dargle River shows it has a Q-rating of Q4 (good) up and downstream of the confluence of the Killough River and until it discharges into the sea at Bray. The Killough River is not monitored by the EPA for its water quality.

4.117 All wastewater from dewatering of the existing flooded quarry void arising during the operational lifetime of the proposed inert soil recovery facility would be discharged downslope to the tributary of the Killough River (via a short section of land drain that flows alongside the R755 Regional Road and a culvert under the road).

4.118 During the operation of the inert soil recovery facility and backfilling of the quarry void, surface water run-off including incidental rainfall will also be discharged to the tributary of the Killough River.

4.119 It is likely that all discharges of wastewater from Calary Quarry would be broadly compliant with the emission limits set by the existing discharge licence issued by Wicklow County Council on 7th October 2008 (Ref. No. WPL87), though these would be superseded by any waste licence issued by the EPA.

4.120 Any changes in surface water quality as a result of the discharge of wastewater to the Killough River has the potential to impact on the Dargle River Valley pNHA, a valued ecological receptor with hydrological connectivity to the receiving watercourses (the Killough and Dargle Rivers).

Dargle River Valley pNHA

4.121 Water samples taken from the flooded quarry void at Calary indicate that the quality of water that would be discharged to the Killough Stream through any dewatering operations would be of good quality. The discharge of wastewater from the flooded quarry void through any dewatering operations would not require any modification of the existing discharge licence and is not predicted to result in any significant deterioration of water quality in either the Killough or Dargle Rivers. No significant effects are predicted to arise on the Dargle River Valley pNHA as a result of any dewatering operations at Calary Quarry.

4.122 During the operation of the inert soil recovery facility and restoration of the quarry void by backfilling, surface water run-off including incidental rainfall will also be discharged to the tributary of the Killough River. Through the installation of the water management system that will include settlement lagoons for the removal of sediments and a hydrocarbon interceptor to treat the discharge water on-site, it is anticipated that the emission limits set by the existing discharge licence (No. WPL87) will not be exceeded. No significant deterioration of water quality in the Killough and Dargle Rivers is predicted, and no significant effects are likely on the Dargle River Valley pNHA.

Changes in Air Quality (Traffic Emissions)

4.123 The inert soil recovery facility is anticipated to generate an average daily total (AADT) of up to 12 heavy goods vehicles (HGV) movements (ie. 6 two-way trips in and out of the site) per hour through the importation of waste materials. The main route to and from the facility will be along the R755 Regional Road to Junction 8 of the N11 National Primary Road at Kilmacanogue.

4.124 Valued ecological receptors lying within 200m of the centre line of the likely access routes of any HGVs movements associated with the operation of the inert soil recovery facility and backfilling of the quarry void include:

- Glen of the Downs SAC and pNHA; and
- Great Sugar Loaf pNHA.

Glen of the Downs SAC and pNHA

4.125 The Glen of the Downs SAC and pNHA is dissected by the N11 National Primary Road. Even taking a precautionary approach and assuming all 144 HGV movements will be along this particular road and through this designated site, the number of vehicle movements will be below the NRA threshold (<5% increase in the volume of traffic using the road) where further assessment is deemed necessary. Therefore no significant effects are predicted on the Glen of the Downs SAC and pNHA from any changes in air quality from traffic emissions from vehicle movements to and from Calary Quarry.

Great Sugar Loaf pNHA

4.126 Both the N11 National Primary Road and the R755 Regional Road run adjacent to the Great Sugar Loaf pNHA.

4.127 In accordance with the assessment undertaken for the Glen of the Downs SAC any movements along the N11 will be below the NRA threshold where further assessment is deemed necessary. Similarly all HGV movements along the R755 Regional Road will also be below the NRA threshold where further assessment is deemed necessary.

4.128 No significant effects are predicted on the Great Sugar Loaf pNHA from any changes in air quality from traffic emissions from vehicle movements to and from Calary Quarry.

Restoration of the Quarry

4.129 On completion of backfilling activity and restoration of the landform to its pre-quarrying level, topsoil will be spread across the ground surface to a minimum depth of 150mm and seeded with a native grass mix in order to promote stability and minimise soil erosion and dust generation.

4.130 Thereafter, the restored site will be left largely unattended, to be naturally recolonised by native vegetation. It is expected that over time, the infilled site will return to a heathland / grassland habitat, similar to that which originally existed prior to quarrying.

4.131 Through careful design and restoration, there is the opportunity to create a range of features providing opportunities for a range of individual and groups of species, with positive benefits for wildlife and at least of equivalent value (or greater) than those provided currently.

Cumulative Impacts

4.132 There are no other known activities or proposed activities at or within close proximity to the application site that would be likely to result in any significant cumulative impacts on the ecology of local area at this current time. It is therefore considered that no significant cumulative impacts would occur.

Summary of Predicted Significant Effects

4.133 Table 4.11 provides a summary of the predicted effects on the VERs and their significance in the absence of mitigation.

Table 4.11
Summary of Predicted Impacts

Valued Ecological Receptor	Predicted Impact	Significance
Glen of the Downs SAC	No impacts predicted	Not significant
Wicklow Mountains SPA	No impacts predicted	Not significant
Wicklow Mountains SAC	No impacts predicted	Not significant
Knocksink Wood SAC	No impacts predicted	Not significant
Carriggower Bog SAC	No impacts predicted	Not significant
Great Sugar Loaf pNHA	No impacts predicted	Not significant
Powerscourt Waterfall pNHA	No impacts predicted	Not significant
Powerscourt Woodland pNHA	No impacts predicted	Not significant
Glen of the Downs pNHA	No impacts predicted	Not significant
Glencree Valley pNHA	No impacts predicted	Not significant
Dargle River Valley pNHA	No impacts predicted	Not significant
Knocksink Wood pNHA and Nature Reserve	No impacts predicted	Not significant
Carriggower Bog pNHA	No impacts predicted	Not significant

MITIGATION MEASURES

4.134 This section outlines remedial measures that should be taken specifically for mitigation where significant ecological impacts on VERs have been identified in order to reduce the residual impact on the relevant receptor or where measures are necessary to comply with current wildlife legislation.

Breeding Birds

4.135 All wild bird species are afforded protection under the Wildlife Act 1976 as amended by the Wildlife (Amendment) Act 2000 prohibiting: their killing, injuring or taking; damage, destruction or taking of nests in use or being built; and the taking or destruction of eggs. Special protection measures will need to be taken into account where peregrine falcon is confirmed as breeding.

4.136 To avoid destruction of any such nests all suitable nesting habitat, including trees/shrubs and ground nesting vegetation, would be removed / stripped from the working areas outside of the breeding season (i.e. removal permitted from October through to February). If this timeframe cannot be adhered to, an experienced ecologist or ornithologist will check the areas to be taken for the presence of tree and ground nesting birds prior to disturbance of the habitat, so that breeding sites can be identified and their clearance delayed until any young have fledged.

4.137 In respect to peregrine falcon, the site will be checked for any signs of nesting peregrine falcons before any works commence at this site. Where evidence of nesting is recorded, Roadstone Limited will adhere to guidance provided by

Notice Nature guideline - *Wildlife Habitats & the Extractive Industry* for the avoidance of disturbance to any breeding peregrine falcon. This will include the establishment of a suitable buffer and no working zone up to a minimum of 150m from the nest site allowing birds which are nesting on quarry faces to be left undisturbed until any chicks have fledged.

RESIDUAL EFFECTS

4.138 No significant residual ecological impacts are predicted from the proposed development and operation of an inert waste recovery facility at Calary Quarry to facilitate its restoration by backfilling to former ground level using imported soil and stone and re-establishing a heathland / grassland habitat, similar to that which existed prior to quarrying.

LEGAL AND POLICY IMPLICATIONS OF IMPACTS

4.139 This section summarises the significance of impacts in the context of statutory legislation and planning policy.

Legal Implications

4.140 The proposed development at Calary Quarry has no implications for any statutory designated nature conservation sites.

4.141 The only statutory protected species with relevance to the proposed quarry extension are likely to breeding birds including potentially the peregrine falcon. However, provided that appropriate mitigation strategies are properly implemented it will be possible for the proposed development to proceed at this site without the risk of breaching current wildlife legislation.

Policy Implications

4.142 Provided that all appropriate mitigation measures to prevent, reduce or offset an impact are implemented it is considered that the proposed operation of the inert soil recovery facility at Calary Quarry, the backfilling of the quarry void using imported inert soil and stone and its final restoration would comply with the requirements of current national, regional and local planning policies.

SUMMARY AND CONCLUSIONS

4.143 Roadstone Limited is applying for planning permission for for the development and operation of an inert soil recovery facility for the backfilling and restoration of a quarry void using imported inert soil and stone at Calary Quarry, Kilmacanogue, Co. Wicklow.

4.144 The planning application seeks permission for the following:

- Use of approximately 3,280,000 tonnes of imported inert natural materials, principally excess soil, stones and/or broken rock to backfill and restore a large existing void created by previous extraction of bedrock;
- Installation of temporary site infrastructure and services including, site office, staff welfare facilities, weighbridge (with dedicated office), wheelwash, settlement ponds, pumphouse, hardstand areas, fuel and

water storage tanks, waste inspection and quarantine facility and storage sheds;

- Temporary stockpiling of topsoil pending re-use as cover material for final restoration of the site;
- Backfilling of the quarry to a final ground profile falling from approximately 290mOD on the eastern side of the quarry to approximately 250mOD on its western side
- Restoration of the infilled void to a heathland / grassland habitat, similar to that which originally existed prior to quarrying.

4.145 The application site, covering 9.1 ha, is not subject to any statutory or non-statutory designation and no such sites are predicted to be directly or indirectly impacted upon through the proposed development at Calary Quarry.

4.146 No valued species have been identified as being present in or immediately adjacent the application site although the site is considered to form part of a territory for peregrine falcon. However, through the implementation of appropriate mitigation, the proposed development is not predicted to impact on the distribution or local population status of peregrine falcon or upon any other individual or group of species.

4.147 The restoration of the quarry upon completion of backfilling will restore the land back to a heathland / grassland habitat. In the long-term, the restored site would have an ecological value similar to that which currently exists. However, the restoration will also provide an opportunity to create habitat features that would have benefits for wildlife over the longer-term at this site.

4.148 On completion, the restored landform will merge into the surrounding local landscape which currently comprises a heathland / grassland mosaic and areas of gorse. As such, it will also eliminate any adverse landscape or visual impacts presented by exposed high rock faces and will significantly improve the views or prospects of the western slopes of the Great Sugar Loaf from viewpoints and locations within the surrounding rural landscape.

ECOLOGY 4

FIGURES

Figure 4.1
Designated Sites

Figure 4.2
Habitat Plan

KNOCKSINK WOOD SAC / pNHA - 000725

DARGLE RIVER VALLEY pNHA - 001754

POWERSCOURT WOODLAND pNHA - 001768

GLENCREE VALLEY pNHA - 001755

GREAT SUGAR LOAF pNHA - 001769

WICKLOW MOUNTAINS SAC - 002122

POWERSCOURT WATERFALL pNHA - 001767

GLEN OF THE DOWNS SAC . pNHA - 000719

WICKLOW MOUNTAINS SPA - 004040

CARRIGGOWER BOG SAC / pNHA - 000716

0 500 1000 1500 2000m 3000 4000 5000

Metres 1:50,000

N W E S

NOTES

1. ORDNANCE SURVEY IRELAND LICENCE NO. **SU 0000716 (C)** ORDNANCE SURVEY IRELAND & GOVERNMENT OF IRELAND

2. MAPPING FROM ORDNANCE SURVEY DISCOVERY SERIES MAPPING - MAP NO'S 68, 69, 76 & 77

LEGEND

- ROADSTONE LIMITED LAND INTEREST (c.25.4 Hectares)
- PLANNING APPLICATION AREA (c.9.1 Hectares)
- 5KM RADIUS FROM PLANNING APPLICATION AREA
- NPWS - SPECIAL AREA OF CONSERVATION (SAC)
- NPWS - SPECIAL PROTECTION AREA (SPA)
- NPWS - PROPOSED NATURAL HERITAGE AREA (pNHA)

SLR CONSULTING IRELAND
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN 14
T: +353-1-2964667
F: +353-1-2964676
www.slrconsulting.com

ROADSTONE LIMITED

ENVIRONMENTAL IMPACT STATEMENT

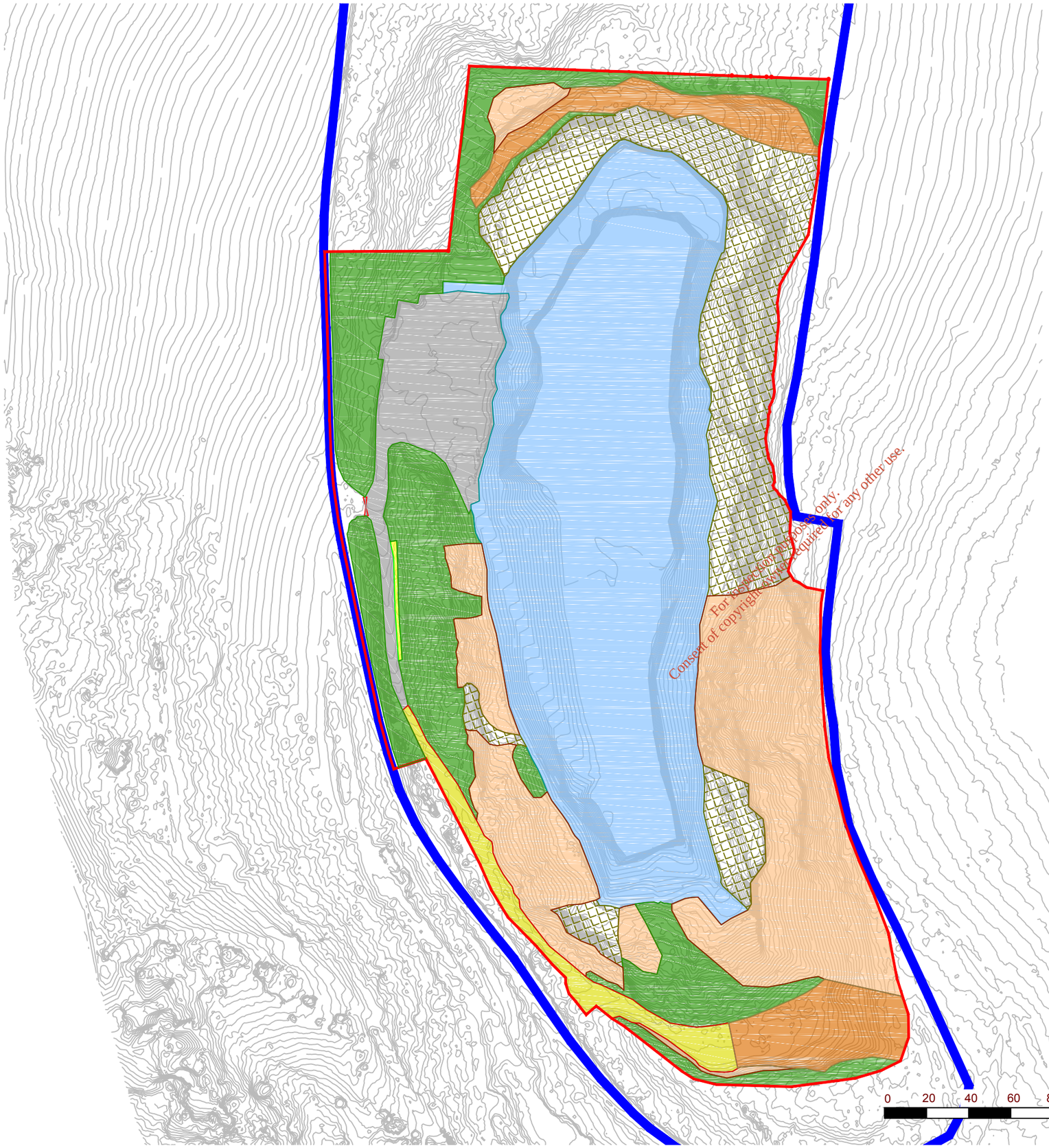
INERT SOIL WASTE RECOVERY FACILITY
CALARY QUARRY,
KILMACANOGE, CO. WICKLOW

LOCATION OF DESIGNATED SITES

FIGURE 4-1

Scale	Date
1:50,000 @ A3	MAY 2016

00180.00109.0.FIG_4-1.Location of Designated Sites.dwg



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LEGEND

- ROADSTONE LIMITED LAND INTEREST (c.25.4 Hectares)
- PLANNING APPLICATION AREA (c.9.1 Hectares)
- BL3 BUILDINGS & ARTIFICIAL SURFACES
- ED2 SPOIL & BARE GROUND
- ED3 RECOLONISING BARE GROUND
- ER1 EXPOSED SILICEOUS ROCK
- ER3 EXPOSED SILICEOUS SCREE AND LOOSE ROCK
- FL8 OTHER ARTIFICIAL LAKES AND PONDS
- GS2 DRY MEADOWS AND GRASSY VERGES
- WS1 SCRUB

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ROADSTONE LIMITED
ENVIRONMENTAL IMPACT STATEMENT

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CALARY QUARRY,
KILMACANOGE, CO. WICKLOW

HABITAT PLAN

FIGURE 4-2

Scale	Date
1:2,000 @ A3	MAY 2016

00180.00109.0.FIG_4-2.Habitat Plan.dwg