

Niamh Lennon

From: [REDACTED]
Sent: 15 August 2012 14:59
To: Niamh Lennon
Subject: Fwd: 19066 Wexford Quarries AAs
Attachments: Q019 AA Screening DRAFT 09_AUG_2012.doc; ATT4070472.htm
Categories: Yellow Category

Sent from my iPhone

Begin forwarded message:

From: "andrew speer" <andrewspeer1@gmail.com>
To: niamh.carton@[REDACTED]
Subject: Fwd: 19066 Wexford Quarries AAs

----- Forwarded message -----

From: andrew speer <andrewspeer1@gmail.com>
Date: 9 August 2012 14:55
Subject: 19066 Wexford Quarries AAs
To: niamh.lennon@wexfordcoco.ie
Cc: Richard Nairn <r.nairn@naturaconsultants.com>, Nuala O'Reilly <n.oreilly@naturaconsultants.com>

Niamh,

Please find attached a draft AA Screening for Q019 relating to the lowering of the quarry floor by ~3m, as discussed yesterday (I have included the hydrology report as supporting information in an appendix).

In relation to your query regarding the original AA completed for the original quarry - I would not consider the AA to be null and void, as it applies to the planning consent granted for the quarry development and restoration *at that time*, and is valid in that regard. The NPWS AA guidance document clearly states that any existing projects that are modified are subject to the AA process. As we discussed, the lowering of the quarry floor to 57m a.O.D. constitutes a modification of the existing quarry development as the quarry was granted permission on a floor level of 60m a.O.D.

The attached AA Screening deals with this modification specifically and concludes that there will not be any significant effects on the nearby Natura 2000 sites.

If the quarry owner is to apply for planning for this modification, then they could simply modify their existing AA to include for the lowering element in the assessment of potential impacts (as we discussed, the lowering of the quarry by 3m will not change the conclusions of that AA).

Regards,

Andrew.

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Niamh Lennon

From: [REDACTED] on behalf of Richard Nairn [r.nairn@naturaconsultants.com]
Sent: 13 August 2012 10:54
To: Niamh Lennon
Cc: Carmel Bristane; Nuala O'Reilly; andrew speer
Subject: Re: 19066 Wexford Quarries AAs
Attachments: Q019 AA Screening DRAFT 09_AUG_2012.doc

Categories: Yellow Category

Niamh,

Can you confirm that you are satisfied with the conclusion of this report on Q019 as sent to you last week?

Regards,

Richard

Richard Nairn
Natura Environmental Consultants
Glanmore, Ashford, Co. Wicklow, Ireland
r.nairn@naturaconsultants.com
www.naturaconsultants.com
Tel: +353 (0)404 34300
Mobile: +353 (0)86 8250414



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On Thu, Aug 9, 2012 at 2:55 PM, andrew speer <andrewspeer1@gmail.com> wrote:
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lowering of the quarry by 3m will not change the conclusions of that AA).

Regards,

Andrew.

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**QUARRY AT BALLINROOAUN, CURRACLOE,
Co. WEXFORD (Q019)**

APPROPRIATE ASSESSMENT

STAGE 1: SCREENING FOR APPROPRIATE ASSESSMENT

Screen Hills cSAC (Site Code 000708)

The Raven SPA (Site Code 004019)

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August 2012



**Natura Consultants, Glenmore,
Ashford, Co. Wicklow, Ireland.**

T: +353 (0) 404 34300

M: (0) 86 825 0414

E: info@naturaconsultants.com

W: www.naturaconsultants.com

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1 INTRODUCTION

1.1 Background

Natura Environmental Consultants was commissioned by Wexford County Council to prepare a Screening for Appropriate Assessment report in relation to a quarry development at Ballinrooaun, Gurracloe, Co. Wexford.

The purpose of this screening report is to determine the effects, if any, of the lowering of the floor of an existing quarry development on the Natura 2000 sites Screen Hills cSAC (Site Code 000708) and The Raven SPA (Site Code 004019), and to assess if any of the predicted impacts of the development have the potential for significant negative effects on the qualifying interests or on the conservation objectives of these designated areas for nature conservation.

The area of the quarry development that has been lowered at Ballinrooaun is not located within the boundary of any of the Natura 2000 sites listed above. The location of the development in relation to nearby Natura 2000 sites is shown on Figure 1 in Section 3.1.

1.2 Legislative Requirements

Flora and fauna in Ireland are protected at a national level by the Wildlife Act, 1976, Wildlife (Amendment) Act, 2000 and the Flora (Protection) Order, 1999 (SI 94/1999). They are also protected at a European level by the EU Habitats Directive (92/43/EEC) and the EU Birds Directive (79/409/EEC) which are transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No 477 of 2011).

Under these directives and acts, sites of nature conservation importance are designated in order to legally protect faunal and floral species and important/vulnerable habitats. The categories of designation are as follows:

- Candidate Special Areas of Conservation (cSAC) are designated under the EU Habitats Directive (92/43/EEC) which are transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No 477 of 2011).
- Special Protection Areas (SPAs) are designated under the EU Birds Directive (79/409/EEC) which are transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No 477 of 2011). These cSACs and SPAs are considered to be of international importance.
- Natural Heritage Areas (NHAs) are designated under the Wildlife (Amendment) Act, 2000. In addition to these there are 630 proposed Natural Heritage Areas (pNHAs) which were published on a non-statutory basis in 1995, but have not since been statutorily proposed or designated. They have limited protection in the form of the Rural Environment Protection Scheme (REPS) which require conservation of pNHAs and operate for a period of 5 years, the Forest Service requirement for NPWS approval before they will pay afforestation grants on pNHA lands and the recognition of the ecological value of pNHAs by Planning and Licensing Authorities such as the County Councils and in the County Development Plan.

~~Under Article 3 of the EU Habitats Directive "a coherent European network of special areas of conservation shall be set up under the title Natura 2000" and "the Natura 2000 network~~

shall include special protection areas classified by the Member States pursuant to Directive 79/409/EEC'. In an Irish context this refers to cSACs and SPAs.

Article 6(3), paragraph 3 of the EU Habitats Directive 92/43/EEC states 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.~~

Under Article 6(3) of the EU Habitats Directive (92/43/EEC) and Regulation 42 of Statutory Instrument No. 447/2011 – European Communities (Birds and Natural Habitats) Regulations, 2011, any plan or project, which is not necessary to the management of a Natura 2000 site and has the potential to significantly affect the integrity of a Natura 2000 Site (i.e. cSAC or SPA), or have a significant effect on the conservation objectives of the site, must be subject to an appropriate assessment. The integrity of a site can be regarded as the coherence of ecological structure and function, across the entirety of a site, which enables it to sustain all of the ecological resources for which it has been valued.

The statutory agency responsible for Natura 2000 sites in Ireland is the National Parks and Wildlife Service of the Department of Arts, Heritage and the Gaeltacht. In March 2010, the requirement for Appropriate Assessment of all development applications was outlined in a circular letter issued by the Department of the Environment, Heritage and Local Government (DoEHLG)¹.

The Department of the Environment, Community and Local Government also released guidance to Planning Authorities on Section 261A of the Planning and Development Act, 2000 as inserted by section 75 of the Planning and Development (Amendment) Act 2010 and amended by Regulation 16 of the European Union (Environmental Impact Assessment and Habitats) Regulations 2011 relating to quarry developments in January of 2012², with supplementary guidance issued in July 2012³.

The Stages in the Appropriate Assessment process

There are 4 stages in the Appropriate Assessment process as outlined in the European Commission Guidance document (2001). The following is a brief summary of these steps;

Stage 1 – Screening for Appropriate Assessment: This stage examines the likely effects of a project either alone or in combination with other projects upon a Natura 2000 Site and considers whether it can be objectively concluded that these effects will not be significant.

¹ Circular NPW 1/10 & PSSP 2/10

² Department of the Environment, Community and Local Government (January 2012) Section 261A of the Planning and Development Act, 2000 and related provisions, Guidelines for Planning Authorities

³ Department of the Environment, Community and Local Government (July 2012) Section 261A of the Planning and Development Act, 2000 and related provisions, Supplementary Guidelines for Planning Authorities

Stage 2 - Appropriate Assessment: In this stage, the impact of the project on the integrity of the Natura 2000 site is considered with respect to the conservation objectives of the site and to its structure and function.

Stage 3 - Assessment of Alternative Solutions: Should the Appropriate Assessment determine that adverse impacts are likely upon a Natura 2000 site, this stage examines ~~alternative ways of implementing the project that, where possible, avoid these adverse impacts.~~

Stage 4 - Assessment where no alternative solutions exist and where adverse impacts remain: Where imperative reasons of overriding public interest (IROPI) exist, an assessment to consider whether compensatory measures will or will not effectively offset the damage to the Natura site will be necessary.

2 METHODOLOGY

2.1 Desk study and consultations

A desk study was carried out to collate available information on the ecological environment and to review mapping of the location of the quarry development in relation to Natura 2000 sites. The National Parks and Wildlife Service (NPWS) database was consulted concerning designated conservation areas and records of rare and protected plant and animal species in the vicinity of the quarry development.

This assessment was carried out with reference to the relevant guidance, in particular:

- *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, European Commission 2001*
- *Managing Natura 2000 Sites: The Provisions of Article 6 of the 'Habitats Directive' 92/43/EEC, European Commission, 2000*
- *Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government. Dublin, 2009 (with revision notes published in February 2010).*
- *Section 261A of the Planning and Development Act, 2000 and related provisions, Guidelines for Planning Authorities. Department of the Environment, Community and Local Government (January 2012)*
- *Section 261A of the Planning and Development Act, 2000 and related provisions, Supplementary Guidelines for Planning Authorities. Department of the Environment, Community and Local Government (July 2012)*

3 STAGE 1: SCREENING FOR APPROPRIATE ASSESSMENT

3.1 Description of the Development

The quarry is located in the townland of Ballinrooaun approximately 2km north of Curracloe, Co. Wexford (as shown on Figure 1 below). The section of the quarry floor which has been lowered is indicated by the yellow line on Figure 2 below. This section of the quarry is located approximately 50m from the boundary of Screen Hills cSAC. The Raven SPA is located approximately 2.3km to the east.

Figure 1: Location of Q019 in relation to nearby Natura 2000 sites

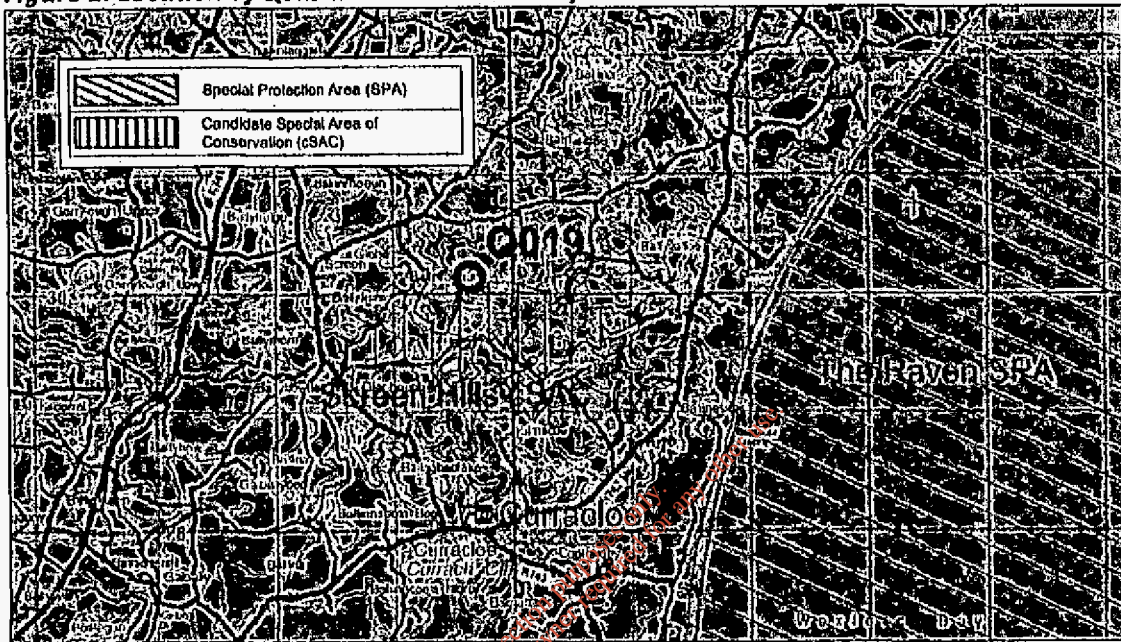


Figure 2: Area of quarry floor to be lowered (indicated by the yellow line)



3.2 Brief Description of the Natura 2000 Site(s)

This Screening for Appropriate Assessment report deals specifically with the predicted impacts of the development on the Natura 2000 site(s);

- Screen Hills cSAC (Site Code 000708)
- The Raven SPA (Site Code 004019)

~~A summary of the site synopsis for the Natura 2000 site(s) is provided below along with the site's qualifying interests and conservation objective(s). The latter are taken from the conservation objective documents. The full versions of these documents are available on the NPWS website at: <http://www.npws.ie/protectedsites/>~~

Screen Hills cSAC (Site Code 000708)

The Screen Hills are located in the south-east of Ireland just north of the Wexford Slob. The site is characterised by the glacial landscape known as "kettle and kame". This term refers to kettlehole lakes in hollows between hills.

The site contains two habitats listed on Annex I of the EU Habitats Directive: oligotrophic lakes and dry heath formations. The many lake basins mark the positions of former ice blocks in an acidic, sandy moraine. The lakes in the site are of two types: those which are more low-lying and in contact with groundwater are influenced by what is occurring over a wide area. Other lakes are suspended at a height above the regional water-table and are influenced by the area immediately surrounding them. These lakes can usually be considered oligotrophic although nutrient input from the adjacent land may change this. The lakes vary in size, most being pond-sized, and have widely different plant and animal communities. These include bog formation in all stages, from open sandy shores with only a narrow band of emergent vegetation, to wide rafts of floating fen type vegetation, to small *Sphagnum* bogs with Royal Fern (*Osmunda regalis*), to consolidated Heather/ Willow/ Birch (*Calluna/Salix/Betula*). Dry heath at the site is extensive and species-rich. The heath vegetation at the site differs from most heaths elsewhere in the virtual absence of Heather, and in the presence of a diverse range of annual species.

The Screen Hills contain important examples of two habitats listed on Annex I of the EU Habitats Directive. The presence of several Red Data Book plant species adds further importance to this site.

Conservation Objective: To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:

- [3110] Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)
- [4030] European dry heaths

The Raven SPA (Site Code 004019)

The Raven SPA is situated on the north side of Wexford Harbour, incorporating the dynamic sand dune system of Raven Point and the coastal strip running north to Blackwater Head. The seaward boundary of the site extends a distance of 2 km from the shoreline. The Raven sand dune system comprises a suite of coastal habitats listed on Annex I of the EU Habitats Directive.

~~The Raven has important bird interests, being part of the Wexford Slob and Harbour complex. Of critical significance is that it forms the principal night roost for the~~

internationally important Wexford Harbour population of Greenland Whitefronted Geese. A range of other waterfowl species are attracted to the site during winter, both for feeding and roosting purposes. The shallow waters within the site are particularly suitable for divers, grebes and seaduck. Counts during the five winters 1995/96 to 1999/00 recorded the following species in Nationally Important numbers (figures are average maxima over the 5 winters): Cormorant (218), Common Scoter (3,234), Red-breasted Merganser (84), Grey Plover (448) and Sanderling (81). The Scoter population represents over 25% of the national total. The population of Red-throated Diver (77) is also of national importance, and these shallow waters support one of the largest populations in the country. Other species which occur in significant numbers include Great Northern Diver (24), Great Crested Grebe (10), Slavonian Grebe (4), Wigeon (67), Mallard (75), Golden Plover (569), Lapwing (115), Knot (131), Dunlin (552), Bar-tailed Godwit (112), Curlew (93), Black-headed Gull (386) and Common Gull (157). Other species using the site include Shelduck (16), Oystercatcher (93) and Ringed Plover (12).

In addition to the Greenland White-fronted Geese, the occurrence of Red-throated Diver, Great Northern Diver, Slavonian Grebe, Golden Plover and Bar-tailed Godwit is of especial conservation interest as these are listed on Annex I of the E.U. Birds Directive.

The Raven SPA is an important breeding site for Little Tern, with up to 30 pairs in some years. The birds nest on the shingle and sandy beaches or on offshore sandbanks. Numbers vary a lot between years, partly due to the suitability of potential nesting habitat after the winter storms. A number of pairs of Ringed Plover breed on the sandy beaches.

This site is of international ornithological importance as it provides crucial roosting habitat for the Wexford Harbour flock of Greenland White-fronted Geese. The site also provides habitat for a range of other species, including six which have populations of National Importance; the Raven is probably the most regular site in the country for Slavonian Grebe. Of particular significance is that six of the wintering species are listed on Annex I of the E.U. Birds Directive, i.e. Red-throated Diver, Great Northern Diver, Slavonian Grebe, Golden Plover, Bar-tailed Godwit and Greenland White-fronted Goose. Little Tern, a species breeding in the site, is also listed on Annex I of this directive. Owing to the recognised importance of the area, Raven Point is a statutory Nature Reserve and a Ramsar site.

The following are the conservation objectives relating to The Raven SPA as set out in the sites conservation objectives document. These objectives are also defined by specific attributes and targets for each qualifying interest:

- To maintain the favourable conservation condition of the wetland habitat in The Raven SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.
- To maintain the favourable conservation condition of the bird species listed as Special Conservation Interests for The Raven SPA

Special Conservation Interests for The Raven SPA;

- Red-throated Diver *Gavia stellata* [wintering]
- Cormorant *Phalacrocorax carbo* [wintering]
- Common Scoter *Melanitta nigra* [wintering]
- Grey Plover *Pluvialis squatarola* [wintering]
- Sanderling *Calidris alba* [wintering]

- Greenland White-fronted goose *Anser albifrons flavirostris* (wintering)
- Wetlands

Conservation Objectives

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing, and
- 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, and
- 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, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Site Integrity

A definition of the concept of the 'integrity of the site' is provided in *Managing Natura 2000 Sites: The Provisions of Article 6 of the 'Habitats Directive' 92/43/EEC*, European Commission, 2000, 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'

A site can be described as having a high degree of integrity where the inherent potential for meeting site conservation objectives is realised, the capacity for self-repair and self-renewal under dynamic conditions is maintained, and a minimum of external management support is required.

When looking at the 'integrity of the site', it is therefore important to take into account a range of factors, including the possibility of effects manifesting themselves in the short, medium and long-term.

This guidance document also states that *'the decision as to whether it (integrity) is adversely affected should focus on and be limited to the site's conservation objectives'*.

3.3 Assessment of Likely Effects

This section of the Screening for Appropriate Assessment Report describes the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the Natura 2000 site(s), describes whether such impacts are likely to occur and whether the predicted impacts are likely to have a significant effect on the integrity of the Natura 2000 site(s) affected.

The following are the individual elements of the quarry development which could potentially give rise to adverse effects on the Natura 2000 site(s) listed above;

- lowering of the quarry floor has the potential to have adverse effects on surface and ground water quality draining to the Natura 2000 sites resulting from contaminated surface water run-off during operational quarrying activities (including such pollutants as diesel, oils and hydraulic fluids and from silt laden run-off or pump discharges from the site);
- lowering of the quarry floor has the potential to have adverse effects on ground water quantity supplying the oligotrophic lakes within Screen Hills cSAC
- lowering of the quarry floor has the potential to have impacts on Screen Hills cSAC resulting from dust levels during operational quarrying activities;

Is the development likely to have a significant effect on, or have the potential to adversely affect the integrity of the Natura 2000 site Screen Hills cSAC (Site Code 000708) as a result of the individual elements of the quarry development outlined above?

The quarry site at Ballinrooan has no surface water connection with Screen Hills cSAC, or any other Natura 2000 site, and as such there is no surface water pathway by which the quarry development could affect any of the Annex I habitats for which the cSAC is selected.

The issue of groundwater impacts on oligotrophic lakes within the cSAC was considered in a report entitled "Contribution to a response (Items 5, 6, 7 and 8) of a request for Further Information from Wexford County Council (letter dated 17/04/2009) for a Sand Pit at Ballinrooan, Screen, County Wexford" prepared by BMA GeoServices in May 2009 as part of the planning process for the quarry development (included in Appendix I). This report found that the winter water table lies at 32-33m a.O.D. which is approximately 27m below the quarry floor of that planning application (at 60m a.O.D.), that groundwater flow in the area is to the north-east (away from the cSAC) and that those lakes located downstream (i.e. to the north-east) of the sand pit are all perched water features and there are therefore no potential risks of impact from sand pit activities. It is considered that the lowering of a portion of the quarry floor by 3m (which would still leave a buffer of 24m to the winter ground water level) would not result in any significant additional risk of adverse effects on the Annex I habitats for which Screen Hills cSAC is selected, to that predicted for the original quarry development, and as such will not have any adverse effects on the conservation objectives of the cSAC.

An Appropriate Assessment was carried out for the original planning application for the quarry at Ballinrooan which considered the potential for dust and wind blown sand associated with quarrying activities to adversely affect habitats within Screen Hills cSAC. It was considered in this AA that any such materials would be deposited within 20m of the quarry boundary and would "lighten existing soils and improve the habitat for most of the specialised plants for which the site is designated". It is therefore considered that the lowering of a portion of the quarry floor by approximately 3m would not result in any adverse effects on any of the Annex I habitats for which the cSAC is selected

Given that the lowering of the quarry floor does not have any direct or any potentially significant indirect effects on Screen Hills cSAC, it is considered that there are no other projects or planning permissions in the area likely to have any significant "in combination effects" with the quarry on this Natura 2000 site.

~~Is the development likely to have a significant effect on, or have the potential to adversely affect the integrity of the Natura 2000 site The Raven SPA (Site Code 004019) as a result of the individual elements of the quarry development outlined above?~~

The quarry site at Ballinrooan has no surface water connection to any watercourses and as such does not drain to the SPA. Given the distance of the quarry from the SPA and the absence of any pathway for indirect impacts (such as a surface water connection), it is not considered likely that quarrying activities would have any adverse effects on important feeding, breeding or roosting sites of the wintering birds for which the SPA is designated.

Given that the quarry does not have any direct or any potentially significant indirect effects on The Raven SPA, it is considered that there are no other projects or planning permissions in the area likely to have any significant "in combination effects" with the quarry on this Natura 2000 site.

3.4 Screening Conclusion

It has been concluded that there will be no risk of significant negative effects on Screen Hills cSAC or The Raven SPA, either alone or in combination with other plans or projects, and therefore, no adverse effect on the integrity of these Natura 2000 sites as a result of the lowering of the quarry floor to 57 a.O.D. Therefore, Stage 2 of the Appropriate Assessment process (Natura Impact Statement) is not required.

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4 REFERENCES

Department of the Environment, Community and Local Government (2012a). Section 261A of the Planning and Development Act, 2000 and related provisions, Guidelines for Planning Authorities

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Appendix I

"Contribution to a response (Items 5, 6, 7 and 8) of a request for Further Information from Wexford County Council (letter dated 17/04/2009) for a Sand Pit at Ballinrooaun, Screen, County Wexford" prepared by BMA GeoServices in May 2009.

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Client: Mr. Seon Kelly Prepared by: EurGeol Bruno Tellard, PGeo, M.Sc. Hydrogeology	Contact: Mr. Seon Kelly Address: Ballinrooun, Screen, County Wexford.	Phone: Fax: E-mail:
Reviewed by: EurGeol B. J. Murphy MSc, DIC MIEI	Wexford County Council Received at Counter	Comments: 2 copies issued 21 MAY 2009 Planning Section

Status: Report	Job No. 3326
Version: 2	Date Issued: 20/05/2009

REPORT ISSUE FORM

Ballinrooun, Screen, County Wexford.

for a Sand Pit at

from Wexford County Council (letter dated 17/04/09)

of a request for further information

Contribution to a response (Items 5, 6, 7 and 8)

(Private & Confidential)

REPORT
20082323

Strawhall Business Park,
 Athy Road,
 Carlow,
 Co. Carlow.
 Tel: +353 (0)1 272 1985
 Fax: +353 (0)59 9134490
 Website: www.dma.ie
 Reg No: 335742
 VAT No: 6355742G

Geophysical Geotechnical Environmental



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Mr. Sean Kelly Contribution to a response to Items 5, 6, 7, 8 of a request for further information for a Sandpit at Ballinrooan, Screen, Co. Wexford. May 2009

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 Geological, Hydrogeological, Geotechnical & Geophysical Specialists

AUTHOR	CHECKED	JOB NUMBER	DATE
EurGeol Bruno Tellard, PGeo. M.Sc. Hydrogeology	EurGeol B. J. Murphy MSc. DIC MIEI	3326	April 2009

FOREWORD

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CONFIDENTIAL REPORT

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I. INTRODUCTION

Mr. Sean Kelly has applied to Wexford County Council for planning permission No. 20082323) to retain and extend his sandpit at Ballinrooan, Screen, County Wexford. An Environmental Impact Assessment (EIA) was submitted in September 2008 in support of the application. In March 2009, a subsequent response for further information was provided to Wexford County Council.

Tom Phillips & Associates (TPA) have requested BMA Geoservices Ltd., on behalf of their client Mr. Sean Kelly, to respond to items 5, 6, 7 & 8 of a new request for further information from Wexford County Council (dated 17/04/09).

II RESPONSE TO ITEM 5

"The Planning Authority notes that the report detailing the impacts of the proposed development on the geomorphological feature has failed to indicate the significance of the geomorphological feature nor the significance of any impact on same. Please submit clarifying information to demonstrate the same. Please also submit your proposals to mitigate associated impacts".

This response should be read in conjunction with BMA Report 3286 (dated March 2009).

The Screen Hills are characterised by the glacial landscape variously known as "kettle moraine" or "kettle and kame". This latter term refers to kettlehole lakes in hollows between hills:

- The term "moraine" describes material which has been transported within an ice sheet and deposited directly by it.
- The "kettles" describe steep sided, and often closed depressions in the surface, formed by bodies of ice, which were trapped, and later melted within the sediments at the end of the glaciation, leading to collapse of the ground surface.
- "Kame" describes material which has been deposited from melt water adjacent to an ice sheet, and is usually a terraced landform.

The sandpit at Ballinrooan is being excavated into the Screen Hills, which is located in the east central part of the area described above. The proposed site is located on the southwestern flank of the Ballinrooan Ridge. The Ballinrooan Ridge culminates at 101m above Ordnance Datum (a.O.D.) at about 200m to the NE of the North western corner of the proposed site area. The elevation of the natural ground across the proposed site area ranges from 70m a.O.D. to the SW up to circa 90m a.O.D. to the E. The proposed site area encompasses the second highest hill (above circa 90m a.O.D.) of the area.

The sandpit at Ballinrooan, Screen, Co. Wexford is understood to have been operating prior to 1964 and a large portion of the above mentioned hill located within the proposed area has already been excavated.

The proposed final quarry void will be of 3.45ha, which is deemed an insignificant impact in the context of the overall area as:

- the "kettle and kame" topography encompass a surface area of over 150 km²,
- the area covered by the pNHA (site code 000708) is of circa 1.07km², i.e. the final quarry void will only represent 3.2% of the total pNHA,
- the area covered by the cSAC (site Code 000708) is of circa 0.43km² and has been fully reinstated to the satisfaction of Wexford County Council,
- the exposure created by the Ballinrooan sandpit will blend with the large "kettles" formations naturally found in that type of hummocky topography.

Locally, the removal of subsoils (sands) is a significant impact of the sandpit operation. However, mitigation measures are provided in the restoration plan with the view to blend the void created by the sandpit activities with the local "kettle and kame" topography. Following cessation of operations on site, the proposals include for:

- grading and stepping the sandpit faces to facilitate scrub / grass colonization in a manner that concurs with the ecologist's recommendations and proposals;
- Areas to the periphery of the quarry void to be all profiled to tie them into the local kame and kettle landscape characteristics;

As indicated in the Landscape and visual assessment (Park-Hood, March 2009), "the reduction in height of the hill at Ballinrooan will be difficult to discern in any overview of this area and the rolling panoramic landscape has the capacity to absorb such a change without significant detriment to its inherent character and quality".

III RESPONSE TO ITEM 6

"It is noted that the applicant refers to the re-grading of the face to resemble the kettle/kame topography but that section submitted show a steeply sloped and stepped, geometric, face. This is considered as inappropriate, please clarify this issue and submit revised drawings as appropriate. The applicant is advised that any revised proposed should be accompanied by a revised report on the stability of the slopes, availability of volumes required etc."

This response should be read in conjunction with BMA report no 3072 (dated March 2009). As stated in our report, the Quarry design during the construction phase must be safe to achieve and must allow restoration to a stable and safe land form.

The "Safe Quarry Guidelines to the safety, health and welfare at work (Quarries) regulations 2008" has been used. These guidelines have been written by the UK Health and Safety Authority. In Part 6 of the guidelines (excavations including (Quarry faces), tips and lagoons, the document implies that in the case of weak or very weak rocks and engineering soils (for example clay or sand and gravel deposits) where the vertical height of any excavation exceeds 7.5m, the suitable angle to ensure safety shall not exceed 27°.

The friction angle of the sand has been estimated at around 35°, the slopes are dry, the ground water level lies at least 27 meters below the final floor elevation. The faces are therefore assumed to be fully drained. Due to compaction by ice, the sand will exhibit some interlock, further adding to shear strength, however, as the final slope must be stable against wind and rain water erosion, this compaction has been ignored.

Final slopes of the excavation have been designed at an angle of 1 vertical in two horizontal (i.e. 26.5° from the horizontal). This angle is chosen to give an estimated factor of safety against shear failure in the slope of at least 1.4, and to allow maximum recovery of the sand with minimal loss of land surface, and to still provide stable slope for restoration.

The calculation for the factor of safety assumes a friction angle of 35°, zero cohesion and no groundwater pressure within the slope. Under these conditions the factor of safety against shear failure is given by the tangent of the friction angle divided by the tangent of the slope angle. If any cohesion is present, it will act to increase the stability.

During the construction phase, two horizontal berms, each of 6m width are designed at 15m vertical intervals on the slope to provide soak-aways for any surface run-off running down the slope during construction phase, helping to prevent any development of gullying, and providing a potential access

route onto the face for any subsequent maintenance of the slope. These berms also further reduce the overall slope angle.

The restoration plan prepared by Park Hood Landscape consultants (Drawing No. 4363-L-103) incorporates the slopes angle of 26.5° from the horizontal in accordance with the quarry design prepared by BMA (which deals with the operating phase of the quarry). There will be no impact on the volumes to be extracted during the construction phase.

Providing that the angle of 26.5° from the horizontal is respected, the horizontal berms mentioned above could be smoothed to reduce the "stepped effect" on the sandpit face post excavation.

It should be noted that overtime, gorse bushes are likely to recolonize the faces of the sandpit as can be observed in the larger kettle hole lakes to the south (Ballaghab Lake and Glenbough Lakes) and SouthEast (Doe Lough) of the proposed site. As such, the visual impact of the former berms will be almost imperceptible.

It should also be noted that a similar angle (26.5°) is naturally found on the Southeastern slope of the Ballaghab Lake (c. 10m high faces) and even steeper slopes (45 °) can be found on the slopes of the Glenbough Lake (>20m high faces) both located 600m and 350m to the south of the proposed site respectively.

IV RESPONSE TO ITEM 7

"The Planning Authority has significant concerns that the proposed final face of the pit subsequent to mitigation would be subject to slump and rain water erosion particularly having regard that there will be no planting to stabilise the slope. This would have serious implications as it would be that neither the visual nor the ecological mitigation measures would be successful. Please clarify this issue and supply supporting data and methods. The ecological report should also address this possible instability having regard to the proposed natural regeneration of the site".

As indicated in the response to item 6, the final slopes of the excavation have been designed at an angle of 1 vertical in two horizontal (i.e. 26.5° from the horizontal). This angle is chosen to give an estimated factor of safety against shear failure in the slope of at least 1.4, and to allow maximum recovery of the sand with minimal loss of land surface, and to still provide stable slope for restoration.

The restoration plan includes the reinstatement of the topsoil cover, which will contain the seeds that will allow for the natural revegetation of the site in accordance with the pNHA. This will protect the sandpit faces from slumping and rainwater erosion.

V RESPONSE TO ITEM 8

"The Groundwater assessment submitted is inadequate as it fails to demonstrate whether there are further groundwater fed oligotrophic lakes downstream of the proposed development which could be impacted by the deterioration in groundwater quality. Please submit revised proposals to demonstrate the same".

From the results of our previous Hydrogeological investigation (BMA report 3278, dated March 2009), the sand aquifer underlying the site (and by extend the area) is deep as the winter water table ranges between 32m a.O.D and 33m a.O.D.

The groundwater flow direction across the sandpit area is oriented to the NorthEast (NE), i.e. towards the S^t George Channel.

The hydraulic gradient was calculated to be of the order of 0.0026. This result indicates a relatively flat water table, which is not surprising in a sand and gravel aquifer.

As shown in Figure 1, the lakes located downstream from the quarry are lakes 5, 6 & 7. Other lakes in the area are located at no gradient and too far away to be impacted. They are:

- Beyond 315m: Lake 1;
- Beyond 370m: Lakes 2 to 4;
- beyond 515m (Lakes 8 to 11) to be impacted.

According to the Ordnance Survey Map for the area (Discovery Series Map no. 77), Lakes 1 to 7 lie at elevations ranging between 60m above Ordnance Datum (m a.O.D.) and 80m, i.e. at a minimum of 27m above the water table. These lakes are likely to be perched features.

A reconnaissance survey was carried out by BMA on the 23/04/09 in order to assess the nature of the lakes located downstream from the proposed sandpit. The investigation consisted in digging holes in the perimeter of the lakes and assessing the nature of the soil encountered according to BS 5930 (1999). The water quality of the lakes was also assessed using key indicator parameters (Temperature, pH and Electroconductivity). It should be noted that Lake 7 has been backfilled by the landowner and is no longer accessible. Owing to recent rainfall events, lakes 2 & 5 actually encompassed 2 lakes in hydraulic continuity (Cf. Figure 1).

The predominant soil in the area consists of excessively drained Acid Brown Earth of coarse sand texture. The results of the survey confirmed the presence of a 0.08m (Lake 2) to greater than 1m (Lake 5) thick layer of grey to dark-brown stagnogley in lakes 1 to 6. This poorly drained Gley encountered in the depressions has a loamy texture and often offers a circa 0.25m thick organic layer at the surface. Owing to its low permeability, the Gley creates perched water conditions. In most of the lakes, sand was encountered directly below the layer of Gley. The table below summarises the results of the soil survey:

Location	Depth below surface (in m)	Approximate Thickness (in m)	Description of Gley layer
Lake 1	0.20	0.15	Grey, moist, firm
Lake 2	0.25	0.08	Dark brown, moist, firm
Lake 3	0.34	0.13	Grey, moist, firm
Lake 4	0.23	0.18	Grey, moist, firm
Lake 5	0.19	0.15m	Brown, moist, firm
Lake 6	Surface	>1.0m	Grey, moist, firm
Lake 7	Backfilled	Backfilled	Backfilled

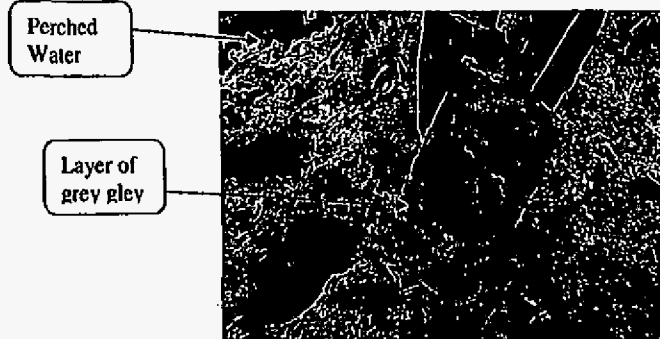
Table 1 - Summary results of Gley layers encountered in the lakes, Ballinrooan, Screen, Co. Wexford.

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Contribution to a response to Items 5, 6, 7, 8 of a request for further information for a Sandpit at Ballinrooan, Screen, Co. Wexford.

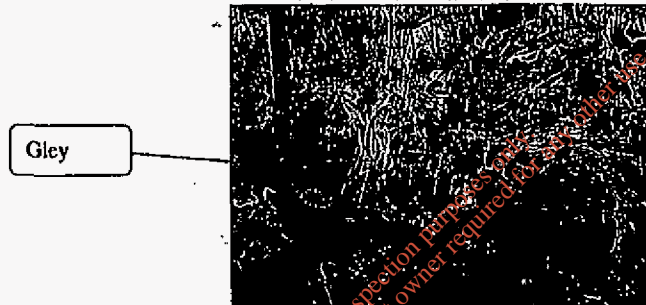
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As can be seen in picture 1 below, even a relatively thin layer (0.08m) of Gley is sufficient to create perched water conditions.



Picture 1 - Thin layer of grey Gley at Lake 2, Ballinrooan, Screen, Co. Wexford.

Picture 2 below, shows that thicker layers (>1.0m) of gleys can be encountered in the lakes downgradient from the proposed sandpit.



Picture 2 - Thick layer of Gley at Lake 5, Ballinrooan, Screen, Co. Wexford.

A field monitoring kit was used to assess the water quality of the lakes mentioned above. The results are summarised in the following table.

Location	pH (in pH units)	Electroconductivity (in uS/cm)	Water Temperature (in °C)	Air Temperature (in °C)
Lake 1	7.02	88	13.5	14.0
Lake 2	7.40	90	13.9	14.0
Lake 3	7.46	191	13.7	14.0
Lake 4	7.43	163	14	14.2
Lake 5	6.97	88	13.9	14.1
Lake 6	6.96	177	12.9	14.0
Lake 7	Backfilled	Backfilled	-	-

Table 2 - Summary results of water quality monitoring in the lakes, Ballinrooan, Screen, Co. Wexford.

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a Sandpit at Ballyvaughan, Screen, Co. Wexford.

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As can be seen, the results show that the water temperature was consistent with the temperature of the air (groundwater fed lakes would tend to have temperatures closer to groundwater, i.e. within the range 10 - 12°C).

Furthermore, the monitoring of the electroconductivity indicates results that are much lower (below 191µS/cm) than what was found in the groundwater at the site (i.e. above 200µS/cm, generally beyond 500µS/cm), suggesting a rainwater source of this water.

In conclusion, the lakes (lakes 5 & 6) located downstream (i.e. to the Northeast) of the proposed sandpit are all perched water features and should not be considered as groundwater fed oligotrophic lakes. There are therefore no potential risks that the sandpit activities could impact on them.

From the results of our previous investigation, the layer of marl encountered at depth across the site confines the sand aquifer (where present), providing an additional degree of protection to the latter. Owing to the low permeability nature of the overburden at depth (where it is saturated), the overburden aquifer is considered to be a poor aquifer. The groundwater will move slowly and be naturally filtered by the fine sediments encountered. As such, other lakes (Lakes 8 to 11, Cf. Figure 1) are located at no gradient and too far away (i.e. beyond 515m) from the sandpit to be impacted.

REFERENCES AND SOURCES OF INFORMATION

1. BMA Geoservices Ltd. Report 3072 (Quarry design, dated March 2009).
2. BMA Geoservices Ltd. Report 3210 (Hydrogeological Desk Study, dated 15/09/08).
3. BMA Geoservices Ltd. Report 3278 (Hydrogeological Investigation, dated March 2009).
4. BMA Geoservices Ltd. Report 3283 (Itemised Response to Wexford County Council, dated March 2009).
5. Discovery Series Map, 2003. Sheets No. 77 (Wexford) Scale 1:50,000. Ordnance Survey, Dublin.
6. Environmental Protection Agency, 2008, Online Maps.
7. Fitzgerald, D. 1994. Monthly and Annual Averages of Rainfall for Ireland 1961-1990. Met Eireann.
8. Gardiner, M.J. and Radford-T., 1980. Soils Associations of Ireland and Their Land Use Potential, 1980. National Survey of Ireland.
9. Geological Survey of Ireland. (D. Tietzsch-Tyler and A.G. Sleeman, 1994). Bedrock Geology 1:100,000 Map Series, Sheet 19, Kildare-Wicklow.
10. Geological Survey of Ireland, 6" maps, Sheet No. 33-1 & 33-3 for County Wexford, GSI, Dublin.
11. Geological Survey of Ireland website (www.gsi.ie): bedrock map, Teagasc Subsoil map, Aquifer map, Aquifer vulnerability Map, Sand & Gravel Aquifer map, Karst Features, Groundwater Well, Geotechnical Viewer Data, 2008. GSI, Dublin.
12. National Parks and Wildlife Service, 2008, Website.

