



ENVIRONMENTAL BALANCE IN DESIGN AND CONSTRUCTION

**APPROPRIATE ASSESSMENT SCREENING REPORT TO ASSESS THE POTENTIAL IMPACTS FROM A PROPOSED INCREASE TO CARBON MONOXIDE LIMIT FOR AN ENGINE AT BALLYDONAGH LANDFILL, WESTMEATH**

**OCTOBER 2014**



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Abstract:

This document comprises the Stage One Screening Report to assess any potential impacts on Natura 2000 sites which may arise from a proposed amendment to the facilities current carbon monoxide (CO) limit for a proposed landfill gas utilisation engine at Ballydonagh Landfill, Westmeath. Stage One is the first stage in an Appropriate Assessment. Appropriate Assessment is required under Article 6 (3) and (4) of the Habitats Directive for any project or plan that may give rise to significant effects on a Natura 2000 site. This assessment follows the methodological guidelines set out in the document 'Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites' (2001) and published guidelines from the Department of Environment, Heritage and Local Government (2009).

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## 1 INTRODUCTION

Fehily Timoney and Company was commissioned by Westmeath County Council (WCC) to prepare an 'Appropriate Assessment Screening', under Article 6(3) of Council Directive 92/43/EEC (Habitats Directive), for a proposed amendment to Ballydonagh's waste licence (licence reference W0028 - 03).

A request was submitted to the EPA on 29 May 2014 requesting an increase to the current licence limit of 650 mg/m<sup>3</sup> for CO from a proposed landfill gas utilisation engine. The EPA have responded requesting the following be carried out:

- A stage 1 Appropriate Assessment screening report to enable the Agency to determine whether an Appropriate Assessment is required (the current report); and
- A screening air dispersion model to demonstrate that emissions at the higher emission limit value for CO will not result in the contravention of any relevant air quality standard which could give rise to negative impacts on nearby designated ecosystems.

An Appropriate Assessment (AA) is an assessment of the potential effects of a proposed plan or project, on its own or in combination with other plans or projects, on one or more Natura 2000 sites (Special Protection Areas (SPA) for birds, Special Areas of Conservation (SAC) for habitats and species). The findings of the exercise will inform the decision taken by the competent authority, in this case the EPA.

### 1.1 Legislative Requirements

Habitats Directive Assessment is a requirement of Article 6(3) and 6(4) of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, also known as the Habitats Directive.

This states:

*6(3) Any plan or project not directly connected with or necessary to the management of the site (Natura 2000 sites) but likely to have 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 sites 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.*

*6(4) If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted. Where the site concerned hosts a priority natural habitat type and/or a priority species the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest.*

## 1.2 Regulatory Context

The Habitats Directive (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora) formed a basis for the designation of Special Areas of Conservation (SACs). Similarly, Special Protection Areas are legislated for under the Birds Directive (Council Directive 79/409/EEC on the Conservation of Wild Birds). SACs and SPAs are referred to as European Sites or Natura 2000 Sites, and form part of the Natura 2000 Network. In general terms, they are considered to be of exceptional importance in terms of rare, endangered or vulnerable habitats and species within the European Community. Under Article 6(3) of the Habitats Directive an Appropriate Assessment must be undertaken for any plan or program that is likely to have a significant effect on the conservation objectives of a Natura 2000 site.

An Appropriate Assessment (AA) is an evaluation of the potential impacts of a plan on the conservation objectives of a Natura 2000 site, and the development, where necessary, of mitigation or avoidance measures to preclude negative effects.

## 1.3 Objectives of Appropriate Assessment

1. The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures to be addressed in the AA process.
2. Firstly, a plan/project should aim to avoid any negative impacts on Natura 2000 sites by identifying possible impacts early in plan making and writing the plan or designing the project in order to avoid such impacts.
3. Secondly, mitigation measures should be applied during the AA process to the point where no adverse impacts on the site(s) remain.
4. Under a worst-case scenario, a project may have to undergo an assessment of alternative solutions. Under this stage of the assessment, compensatory measures are required for any remaining adverse effects, but they are permitted only if (a) there are no alternative solutions and (b) the plan/project is required for imperative reasons of overriding public interest (the 'IROPI test'). European case law highlights that consideration must be given to alternatives outside the plan boundary area in carrying out the IROPI test. It is a rigorous test which plans/projects are generally considered unlikely to pass.

## 1.4 Consultation

Consultation was not carried out as part of this assessment.

## 2 METHODOLOGY

There are 4 stages in an Appropriate Assessment as outlined in the European Commission Guidance document (2001). The overall assessment is conducted by the competent authority, in this case the EPA.

The following is a brief summary of these steps.

*Stage 1 - Screening:* 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.

*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.

In the preparation of this assessment, regard has been given to the Habitats Directive and the European Communities (birds and natural habitats) Regulations 2011 S.I. No. 477 of 2011 and with reference to the relevant guidance, in particular:

- *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 fro Planning Authorities.* Environment, Heritage and Local Government (2009)
- *Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC - Clarification of the Concepts of: Alternative Solutions, Imperative Reasons of Overriding Public Interest, Compensatory Measures, Overall Coherence, Opinion of the Commission.* European Commission (January 2007).

### 3 STAGE 1 – SCREENING

#### 3.1 Introduction

Screening requires a review of all Natura 2000 sites that are likely to be significantly impacted due to a proposed plan or project, and identifies if further assessment is required under the second stage of the AA. The first step is to develop a 'long list' of Natura 2000 sites potentially affected by the project. The project is then described and individual elements are identified and assessed in terms of their potential effects on Natura 2000 sites.

There are 14 Natura 2000 sites within 15 km of Ballydonagh Landfill. The assessment here has been carried out according to the Cause – Pathway – Effect model.

Direct impacts refer to habitat loss or fragmentation arising from land-take requirements for development or agricultural purposes. Direct impacts can be as a result of a change in land use or management, such as the removal of agricultural practices that prevent scrub encroachment.

Indirect and secondary impacts do not have a straight-line route between cause and effect, and it is potentially more challenging to ensure that all the possible indirect impacts of the project/plan – in combination with other plans and projects – have been established. An effect on a nearby habitat or species as a result of the release of a harmful gas would constitute an indirect impact as is the case of this particular assessment.

#### 3.2 Brief Description of the Project

Ballydonagh Landfill is a lined facility that was opened in 1991 licenced to accept 40,000 tonnes of non-hazardous municipal solid waste (MSW) waste per annum. Landfilling activities ceased at the site and the landfill body has been capped since 2010.

It is proposed to install a landfill gas utilisation engine at the facility as part of the Midlands Gas Utilisation Contract. This contract includes three waste licenced landfill sites namely:

- Ballydonagh Landfill
- Kyletalesha Landfill
- Derryclure Landfill

The economic viability of utilisation on Ballydonagh Landfill is marginal as a result of declining landfill gas volumes and calorific values. Implementation of the current CO emission limit value (ELV) of 650 mg/m<sup>3</sup> would in fact jeopardise the possibility of utilisation on the site. Landfill gas utilisation has significant environmental benefits as it assists in the control of fugitive emissions from the site while provided a source of renewable energy. A review of the Kyletalesha (Licence ref no W0026-03) and Derryclure (Licence ref no W0029/04) waste licences indicated that these facilities are afforded a much higher emission limit value (ELV) of 1,400 mg/m<sup>3</sup> for CO.

Consequently, WCC submitted a request to the EPA on 29 May 2014 requesting an increase of the CO limit from 650 mg/m<sup>3</sup> to 1,400 mg/m<sup>3</sup> to bring the facility in line with other landfill facilities in the Midlands. Given that there are 14 Natura 2000 sites within 15 km of the landfill, the EPA requested that an air dispersion screening model and a stage 1 screening assessment was conducted.

#### 3.3 Brief Description of the European Sites

There are a total of 14 European Sites located within a 15 km radius of Ballydonagh Landfill. The NPWS site synopses for all European sites considered in this report are available at [www.npws.ie/protectedsites](http://www.npws.ie/protectedsites). The location of European Sites within the zone of influence of the study area is shown in Appendix 3.

Table 3.1: Summary of the European Sites within 15 km of Ballydonagh Landfill

Site Name and Code	Qualifying Interests	Conservation Objectives	Relevant Threats <sup>1</sup>	Distance and Direction to European Site
Crosswood Bog cSAC (002337)	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120]	To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the cSAC has been selected <sup>2</sup> .	None	0.77km N
Carn Park Bog cSAC (002336)	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120]	To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the cSAC has been selected.	None	2.9km NE
River Shannon Callows cSAC (000216)	Otter ( <i>Lutra lutra</i> ) [1355] Molinia meadows on calcareous, peaty or clayey-silt-laden soils ( <i>Molinia caerulea</i> ) [6410] Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> ) [6510] Limestone pavements [8240] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> ) [91E0]	To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the cSAC has been selected.	None	3.6km SW
Middle Shannon Callows SPA (004096)	<i>Cygnus cygnus</i> [wintering] <i>Anas penelope</i> [wintering] <i>Crex crex</i> [breeding ] <i>Pluvialis apricaria</i> [wintering] <i>Vanellus vanellus</i> [wintering] <i>Limosa limosa</i> [wintering]	To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SPA has been selected.	None	3.6km SW

<sup>1</sup> Recorded as a 'vulnerability' in the relevant site's Natura 2000 Standard Data Form ([www.npws.ie/protectedsites](http://www.npws.ie/protectedsites))

<sup>2</sup> 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.

The 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.



Site Name and Code	Qualifying Interests	Conservation Objectives	Relevant Threats	Distance and Direction to European Site
	<i>Chroicocephalus ridibundus</i> [wintering] Wetlands			
Lough Ree cSAC (000440)	Otter ( <i>Lutra lutra</i> ) [1355] Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation [3150] Semi-natural dry grasslands and scrubland facies on calcareous substrates ( <i>Festuco Brometalia</i> )(*important orchid sites) [6210] Degraded raised bogs still capable of natural regeneration [7120] Alkaline fens [7230] Limestone pavements [8240] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in British Isles [91A0] Bog woodland [91D0]	To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the cSAC has been selected.	None	6km NW
Lough Ree SPA (004064)	Whooper Swan ( <i>Cygnus cygnus</i> ) [A038] Wigeon ( <i>Anas penelope</i> ) [A050] Teal ( <i>Anas crecca</i> ) [A052] Mallard ( <i>Anas platyrhynchos</i> ) [A053] Shoveler ( <i>Anas clypeata</i> ) [A056] Tufted Duck ( <i>Aythya fuligula</i> ) [A061] Common Scoter ( <i>Melanitta nigra</i> ) [A065] Goldeneye ( <i>Bucephala clangula</i> ) [A067] Little Grebe ( <i>Tachybaptus ruficollis</i> ) [A004] Coot ( <i>Fulica atra</i> ) [A125] Golden Plover ( <i>Pluvialis apricaria</i> ) [A140] Lapwing ( <i>Vanellus vanellus</i> ) [A142] Common Tern ( <i>Sterna hirundo</i> ) [A193] Wetlands	To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SPA has been selected.	None	6km NW
Pilgrim's Road Esker cSAC (001776)	Semi-natural dry grasslands and scrubland facies on calcareous substrates ( <i>Festuco Brometalia</i> )(important orchid sites) [6210]	To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the cSAC has been selected.	None	8.1km SW
Mongan Bog cSAC (000580)	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the	To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the cSAC has been selected.	None	8.3km SW

Site Name and Code	Qualifying Interests	Conservation Objectives	Relevant Threats <sup>1</sup>	Distance and Direction to European Site
Mongan Bog SPA (004017)	Rhynchosporion [7150] Greenland White-fronted Goose ( <i>Anser albifrons flavirostris</i> ) [A395]	To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SPA has been selected.	None	8.3km SW
Fin Lough (Offaly) cSAC (000576)	Vertigo geyeri [1013] Geyers Whorl Snail Alkaline fens [7230]	To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the cSAC has been selected.	None	10.5km SW
Ferbane Bog cSAC (000575)	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the <i>Rhynchosporion</i> [7150]	To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the cSAC has been selected.	None	12.1km S
Moyclare Bog cSAC (000581)	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the <i>Rhynchosporion</i> [7150]	To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the cSAC has been selected.	None	13.7km S
Castlesampson Esker cSAC (001625)	Turloughs [3180] Semi-natural dry grasslands and scrubland facies on calcareous substrates ( <i>Festuco Brometalia</i> )(important orchid sites) [6210]	To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the cSAC has been selected.	None	13.7km W

### 3.5 Air Screening Model

A screening air dispersion model was conducted using the modelling software AERSCREEN. The model calculates the maximum 1 hour concentrations at defined receptors.

The AERSCREEN programme also includes averaging time factors for worst-case 3-hr, 8-hr, 24-hr and annual averages.

Emissions for a landfill gas utilisation engine were sourced from the manufacturer Jenbacher. The engine was modelled as a point source with the following physical characteristics:

**Table 3.2: Physical Parameters for Landfill Gas Utilisation Engine**

Source	Release Height (m)	Stack Diameter (m)	Flow Rate (m <sup>3</sup> /s)	Average Discharge Temperature (°C)
Engine	8	0.6	4.2	555

\* Flow rate is based on the maximum flow rate outlined in schedule C. of the waste Licence (P0028-03) uncorrected for operating temperature, pressure, moisture and oxygen.

The maximum emission limit value (ELV) for CO (1,400 mg/m<sup>3</sup>) was taken from a review of the waste licence for Kyletalesha Landfill (Licence ref no W0026-03) and Derryclure landfill (Licence ref no W0029/04).

In accordance with the EPA's Office of Environmental Enforcement (OEE), *Air Dispersion Modelling from Industrial Installations Guidance Note (AG4), 2010* the ambient air quality standards relevant to Ireland are the EU Ambient Air Quality Directives 2008/50/EC and 2004/107/EC. These Directives have been transposed into Irish Law by the Irish ambient air quality standard, S.I. No. 180 of 2011 – Air Quality Standards Regulations, 2011 and S.I. No. 58 of 2009 – Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations 2009.

The air quality limits for CO (as specified in S.I. No. 180 of 2011) as 10,000 ug/m<sup>3</sup> for an 8 hour period.

The results of this worst case screening model indicate that the predicted 8 hour averaging concentrations of CO are significantly below the legislative limits which protect both human health and sensitive ecosystems. The table of results is included in Appendix 2 of this report.

The predicted 8 hour averaging concentrations were calculated using the maximum 1 hour concentrations from the model and an averaging factor of 0.9 based on the guidance in Section 4.5.4 of the EPA screening guidance document (U.S. EPA, 1992).

### 3.5 Screening Assessment

The following screening assessment is carried out in accordance with EU Guidance (EC, 2001) and using the standard screening assessment form provided in Annex 2 of the EU Guidance document.

Implicit in the Habitats Directive is the application of the precautionary principal, which is used (i) where there is potential for negative effects and (ii) where due to inconclusive or insufficient data it is not possible to determine with sufficient certainty the risk in question (EC, 2000b).

Assessment Criteria	
Describe 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 sites.	Increased emissions of carbon monoxide (CO).
Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the Natura 2000 site by virtue of: <ul style="list-style-type: none"> <li>▪ Size and scale;</li> <li>▪ Land-take;</li> <li>▪ Distance from Natura 2000 site or key features of the site;</li> <li>▪ Resource requirements;</li> <li>▪ Emissions;</li> <li>▪ Excavation requirements;</li> <li>▪ Transportation requirements;</li> <li>▪ Duration of construction, operation etc.;</li> <li>▪ Others.</li> </ul>	The emission of elevated levels of CO may have the effect of impairing individual plants and species within the designated sites and thereby having an impact at a habitat or species level. At the levels proposed and as predicted by the air screening model the magnitude of this impact is imperceptible.
Describe any likely changes to the site arising as a result of: <ul style="list-style-type: none"> <li>▪ Reduction of habitat area;</li> <li>▪ Disturbance of key species;</li> <li>▪ Habitat or species fragmentation;</li> <li>▪ Reduction in species density;</li> <li>▪ Changes in key indicators of conservation value;</li> <li>▪ Climate change.</li> </ul>	No changes to any European Site are likely to occur as a result of the proposed amendment to the waste licence for Ballydonagh Landfill.  CO is a very weak direct greenhouse gas but can react to form Ozone. At concentrations predicted by the worst case model its effect on climate change will be imperceptible.
Describe any likely impacts on the Natura 2000 site as a whole in terms of: <ul style="list-style-type: none"> <li>▪ Interference with the key relationships that define the structure of the site;</li> <li>▪ Interference with key relationships that define the function of the site.</li> </ul>	No impacts to any European Site are likely to occur as a result of the proposed amendment to the waste license.
Describe from the above those elements of the project or plan, or combination of elements, where the above impacts are likely to be significant or where the scale of magnitude of impacts is not known.	None.

A finding of no significant effects report has been completed for this site. This is presented in Appendix 1 of this document.

### 3.5 Conclusions

An assessment of potential CO air emissions from a proposed amendment to the waste licence limit for Ballydonagh Landfill was conducted. This assessment included an air dispersion screening model which predicted maximum ground level concentrations at Natura 2000 sites within 10 km of the landfill. Results from the model indicated that predicted concentrations of CO at these sites were significantly below the ambient air quality limit set out in the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011).

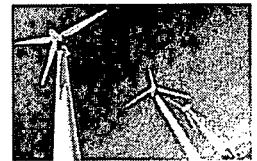
A finding of no significant effects on Natura 2000 sites was determined and consequently A Stage 2, Natura Impact Statement is not required.

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# Appendix 1

## Finding of No Significant Effects Report

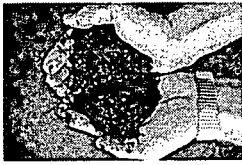
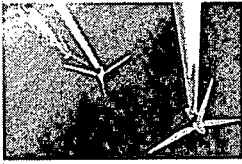
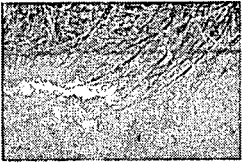
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<b>Finding of No Significant Effects Report</b>			
<i>Name and location of the Natura 2000 sites</i>		See Table 3.1 of this report.	
<i>Description of the project or plan</i>		See section 3.2 of this report.	
<i>Is the Project or Plan directly connected with or necessary to the management of the site (provide details)?</i>		No.	
<i>Are there other projects or plans that together with the project of plan being assessed could affect the site (provide details)?</i>		None that are known.	
<b>The Assessment of Significant Effects</b>			
<i>Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 site</i>		An increase in CO emissions may have the effect the survival of individual plants and species within the designated sites and thereby having an impact at a habitat or species level.	
<i>Explain why these effects are not considered significant</i>		<p>Statutory Instrument S.I. No. 180 of 2011 sets a limit on CO for the protection of human health. A limit on CO for the protection of vegetation is not set and therefore the level set for the protection of human health is referred to here.</p> <p>The maximum daily 8-hour mean for the protection of human health is 10,000 ug/m<sup>3</sup>. The averaged 8-hour concentration of CO modelled using AERSCREEN by FTC predicted a maximum result of 101.6 µg/m<sup>3</sup> which is significantly below the limit. Concentrations of CO predicted at each of the Natura 2000 sites were in fact lower than the maximum. The results of this modelling are presented in Appendix 2.</p> <p>Therefore the maximum concentration expected following an increase of the emissions limit to 1,400 mg/m<sup>3</sup> is many times less than the standards set for the protection of human health. The impact of this concentration on European Sites would be negligible or imperceptible.</p>	
<b>Name of Agency or Body Consulted</b>		<b>Summary of Response</b>	
n/a			
<b>Data Collected to Carry out the Assessment</b>			
<i>Who carried out the assessment</i>	<i>Sources of Data</i>	<i>Level of assessment completed</i>	<i>Where can the full results of the assessment be accessed and viewed</i>
This assessment was completed by Fehily Timoney and Company	Existing documentation from NPWS, desktop study, FTC air dispersion modelling.	Stage 1 Screening Report for Appropriate Assessment	FTC, Core House, Pouladuff, Cork.

## Air Quality Modelling

# Appendix 2



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### Air Quality Modelling Results

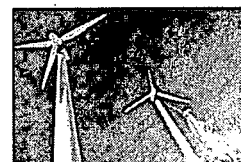
Name	Distance (km)	Designation	Maximum 1 hour CO Concentration ( $\mu\text{g}/\text{m}^3$ )	Scaled Maximum 8 hour CO Concentration ( $\mu\text{g}/\text{m}^3$ )
Crosswood Bog	0.77	SAC and pNHA	77.672	69.9048
Carn Park Bog	2.9	SAC and pNHA	85.085	76.5765
River Shannon Callows	3.6	SPA and SAC	53.381	48.0429
Lough Ree	6	SPA and SAC	19.217	17.2953
Pilgrims Road Esker	8.1	SAC	18.32	16.488
Mongan Bog	8.3	SPA and SAC	17.968	16.1712
Fin Lough (Offaly)	10.5	SAC and pNHA	20.87	18.783
Ferbane Bog	12.1	SAC and pNHA	16.192	14.5728
Castlesampson Esker	13.7	SAC	20.895	18.8055
Moyclare Bog	13.7	SAC and pNHA	20.895	18.8055

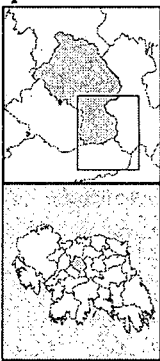
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# Appendix 3

## Location of European Sites

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**NATURA 2000 Designations**

- Special Area of Conservation (SAC)
- SPA and SAC Designation
- Special Protection Area (SPA)

Date: 24/04/2014

Name Of Client: Westmeath County Council

Name Of Job: AA Screening for increased Emission Utilisation

Title Of Figure: Natura 2000 sites within a 15km Radius

Scale Used: 1:35,000

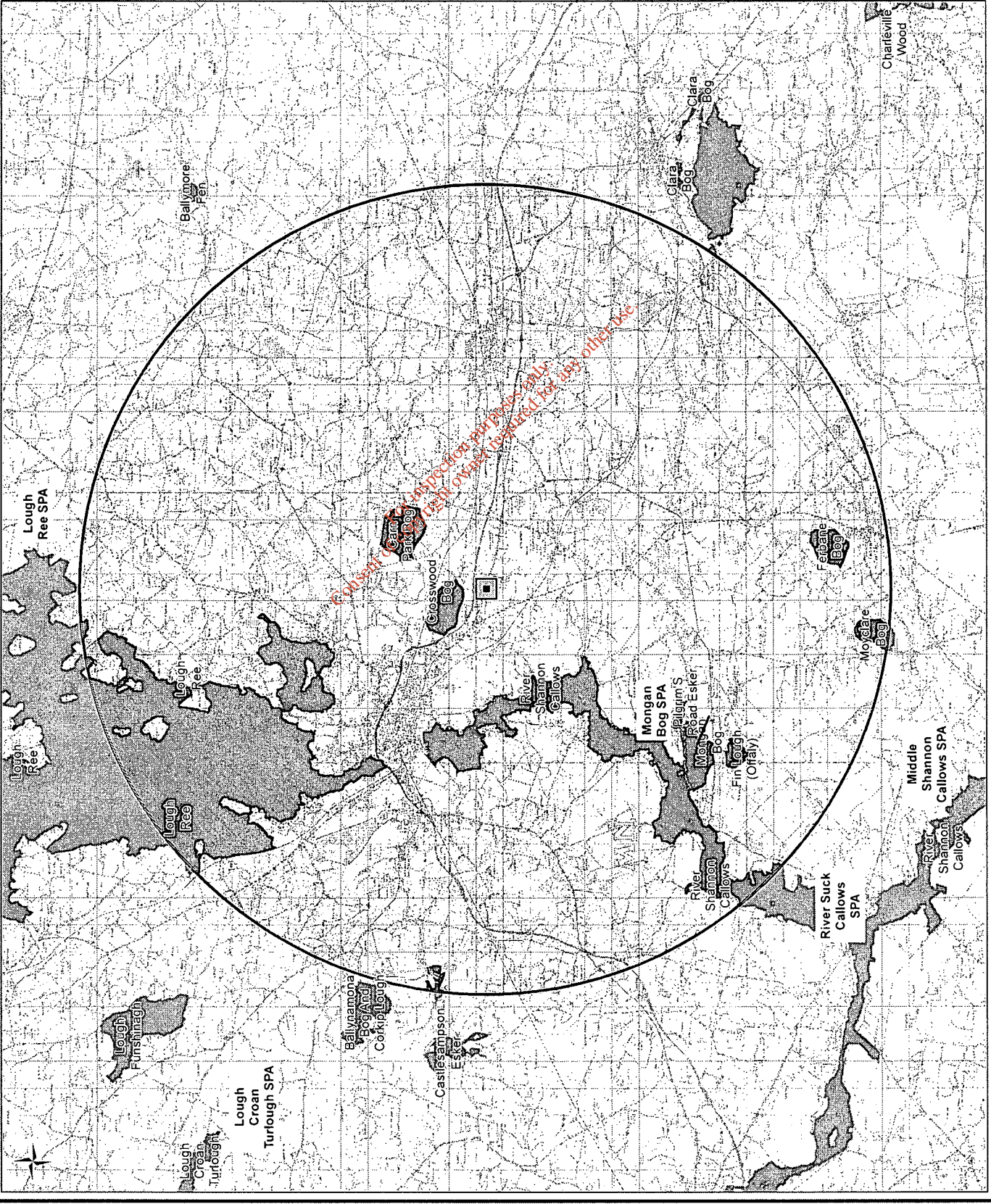
Figure No.: 1.1

Rev: A

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